

COMPUTERWORLD

Compaq, DEC lead bid to trump Sun with ACE

BY MARYFRAN JOHNSON
and RICHARD PASTORE
CW STAFF

NEW YORK — Like a new religion rolling into a town full of churches, the Advanced Computing Environment initiative has a lot of preaching to do before it will win converts to its proposed standard for multivendor networked computing, users and analysts said last week.

Led by Compaq Computer Corp., Digital Equipment Corp. and Mips Computer Systems, Inc., 21 firms joined in a pact to develop dual standards for personal computers and reduced instruction set computing systems.

Microsoft Corp. will provide OS/2 Version 3.0 — a version of OS/2 that is portable to RISC platforms — and The Santa Cruz Operation will incorporate DEC's Ultrix and the Open Soft-

ware Foundation's OSF/1 operating systems into its Unix-based Open Desktop software.

Along the way, the group hopes to derail the momentum of Sun Microsystems, Inc.'s Scalable Processor Architecture and

RISC factors

- Support for Intel Corp.'s 80386/486 and Mips Computer Systems, Inc.'s RISC chip.
- New Technology OS/2 from Microsoft Corp. and an Open Desktop Unix based on OSF/1 and DEC's Ultrix.
- Standardized boards and peripherals based on EISA or DEC's Turbochannel.

More details, reaction, pages 6-7.

corner the commercial RISC market by making shrink-wrapped, off-the-shelf Unix and OS/2 software widely available.

While many users are watching the effort with keen interest, others are unhappy about the

Continued on page 6

PC lineup set for 486 'SX'

BY MICHAEL FITZGERALD
and RICHARD PASTORE
CW STAFF

Intel Corp.'s 20-MHz low-end 486 microprocessor, set to debut next week, may offer enough of a price/performance value to finally draw significant numbers of users to the 486 processor family, a sluggish seller so far.

With system announcements expected to follow hot on the heels of the chip's release date, some users are eager for an SX-like 486-based system they can cost-justify for desktop use, but

others wonder how they will use the power.

"Most people today are using the 486 as a server; it's hard to justify putting a 486 on a desktop," said James Sutter, vice president and general manager at Rockwell International Corp.

Continued on page 105

Microsoft probe broadens

BY CLINTON WILDER
and JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. disclosed Friday that the Federal Trade Commission has expanded its investigation into the company's business practices, apparently in response to complaints from competitors and developers.

Microsoft was notified by the FTC Wednesday that the commission will examine "third-party allegations that Microsoft has monopolized or attempted to monopolize the market for operating systems, operating environments, computer software

THE FTC INVESTIGATION will "be substantially broader" than its ongoing probe into "an alleged horizontal agreement between Microsoft and [IBM]."

and computer peripherals for personal computers."

In a letter to Microsoft, the FTC said the subject area of the investigation would "be substantially broader" than its ongoing

probe into "an alleged horizontal agreement between Microsoft and [IBM]." The FTC's original focus was on a 1989 agreement between Microsoft and IBM to cooperate on OS/2 and Windows [CW, March 18].

The FTC has broad investigative purview and the power to institute a cease-and-desist order for specific business practices it judges unfair. "If they were to decide that there has been a legal violation, they generally try to negotiate toward a consent decree," said Jonathan Feil, a software attorney at Simburg, Ketter, Sheppard & Purdy in Seattle.

Continued on page 8

IBM Credit's giant shadow chills foes

BY NELL MARGOLIS
CW STAFF

STAMFORD, Conn. — IBM Credit Corp. marked its 10th anniversary this year bigger, bolder and, in the view of some competitors, badder than ever.

The wholly owned finance and leasing subsidiary of IBM has attained giant status in its own right, building an asset base of \$11 billion mainly by providing financing options for customers who buy the expensive mainframes built by its parent.

However, the firm's rapid rise, blue-blooded pedigree and occasional reminders of the power implied by both make it a

Big credit

The financial power of IBM Credit Corp. accounted for more than \$10 billion in computer purchases in 1990

(In millions)

Products purchased for lease to users	Receivables purchased from IBM	Industry remarketer financing revenue	Government installment purchase obligations, bought from IBM
\$3,602	\$455	\$5,670	\$535.6

CW Chart: Marie Haines

constant source of speculation and controversy. Most recently, ICC launched lawsuits against members of the third-party subleasing market over the alleged practice of stripping IBM equipment and reselling the parts.

ICC accounted for about 67% of all new equipment leasing contracts as of 1989 and has only gained since then, according to Gartner Group, Inc., located here.

An estimated 50% of all
Continued on page 103

Encryption pact in works

Six vendors to standardize on common scheme

BY MICHAEL ALEXANDER
CW STAFF

REDWOOD CITY, Calif. — At least six major computer vendors are preparing to endorse a public-key encryption system developed by RSA Data Security

ty, Inc., a move that will allow the private sector to shuttle scrambled data among different platforms.

The group includes Novell, Inc., Lotus Development Corp. and Digital Equipment Corp., which have already signed licensing agreements in the past year to use RSA's encryption system. Sun Microsystems, Inc., Apple Computer, Inc. and Microsoft Corp. are also expected to endorse RSA's system.

A number of other major play-

ers are expected to follow suit, according to Jim Bidzos, president of RSA.

"They are standardizing on RSA in a way that allows them all to interoperate," Bidzos said. The standard would allow an end user on an Apple Macintosh to encrypt a word processing file and transfer it over a network to a DEC workstation, where it could be decrypted, he said.

Some security experts are skeptical that the vendors' endorsement of public-key cryptography will be enough to make RSA's version a standard. The industry will not adopt a standard until the federal

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INSIDE

IBM bites the bullet with a onetime pension benefit write-off that pulled an already dismal quarter into the red. Page 8.

Borland previews Paradox for Windows. Page 4.

NCR, AT&T execs weary of takeover battle. Page 105.

Executive Report — End-user training needs improvement, but there are some bright spots. Page 73.

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Quotable

"Compatibility is something you have to work with a bit."

JOE ARCHER
COLONIAL MANAGEMENT

*On the challenge facing the ACE consortium.
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EXECUTIVE BRIEFING

■ There may finally be a way for users to encrypt data and have authorized users on other hardware platforms decipher it. At least six major computer vendors plan to endorse a public-key encryption system developed by RSA Data Security. That endorsement could help business users tighten security on their various systems. However, security analysts warn that a true standard may not emerge until the federal government decides to back an encryption/decryption technology. **Page 1.**

■ While the security coalition may be just taking shape, months of speculation about another gathering of vendors came to a head when DEC, Compaq, Mips Computer Systems and others announced their Advanced Computing Environment initiative. Those computer makers hope to work together to produce compatible workstation products. **Pages 1 and 7.**

■ Distributed computing may now be a reality in the business world. While IS managers still find fault with current distributed computing technologies, more and more managers are exploring the potential of transparent access to data and computing functions spread across multiple platforms. **Page 49.**

■ End-user training in many organizations is hobbled by poorly trained IS teachers, indifference and poor coordination with human resources departments. However, several forward-thinking firms are trying a variety of new approaches to combat this. **Page 73.**

■ Gauging the business value of technology consists of using the appropriate metrics to measure key indicators of IS performance. **Page 77.**

■ The mood of the NCR takeover tiff has shifted from combative to frustrated. Executives from both NCR and rival AT&T indicate that they should be much closer to settling their dispute. **Page 105.**

■ The mainframe as a server may not be a new concept in the computer industry or the user community. However, it won fresh backing from IBM last week when company executives outlined their plans for the ES/9000 family. **Page 27.**

■ Portable computers based on the Intel 80286 chip may be fading into obsolescence, at least for applica-

tions that use some of the more recent technical developments. **Page 37.**

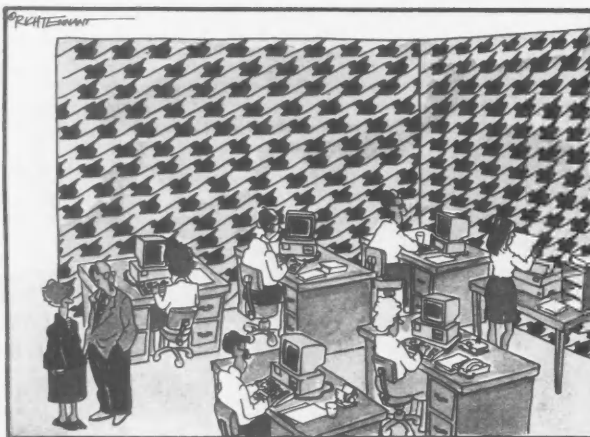
■ Attention CASE wannabes: Your ship is coming in, but it won't be ready to set sail for another three to five years. For now, CASE advocates who can coax the technology into a company are in the most demand. **Page 87.**

■ It's tax day, and the IRS is on many minds. According to a federal report, however, IRS systems flaws may allow some wealthy tax delinquents to worry less about being caught. **Page 104.**

■ In-house systems repairs are helping IS managers slash service budgets, minimize downtime and increase worker productivity. **Page 97.**

■ On-site this week: The success of a single PC application was enough to convince one of the largest U.S. construction companies, Turner Corp., that downsizing was the way to go. **Page 37.** "Book 'em, micro" may be the order of the day in Sunnyvale, Calif., where the police department is testing a PC-based fingerprint identification system. **Page 39.** A different kind of network — the local-area variety rather than one of TV's big three — helped a CATV station find its place in the sun. **Page 49.** Rather than handing their car keys to a parking attendant or roaming through lonely garages, drivers in Barcelona, Spain, will be able to entrust their cars to a computer in an automated parking facility. **Page 31.**

The 5th Wave



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HP unveils modular New Wave Office 3.0

BY J. A. SAVAGE
CW STAFF

Merging its office automation package with the latest version of Microsoft Corp.'s Windows software for the personal computer, Hewlett-Packard Co. released New Wave Office Version 3.0 last week.

Beta-test users said they are finding the release handy in building executive information systems (EIS) in a modular and low-cost way.

"Until six or eight months ago, the only option for an executive information system was to buy the full product at \$200,000," said Peter Strombom, vice president of IS at Meriter Health Services, Inc. in Madison, Wis. "New Wave allows smaller shops like ours to progressively manage data much cheaper."

Strombom and other New Wave Office users said the major part of their systems so far is not New Wave Office, per se, but a couple of the 28 New Wave Office modules on top of the New

Wave PC product, which has been running on Windows 3.0 for about one year.

"We're primarily using the base New Wave software [on PCs]," said John Bullock, director of IS at Valley Presbyterian Hospital in Van Nuys, Calif., which is also building an EIS. "As

we move further along, we will get into word processing and mail. We're looking at how it fits into place," he said.

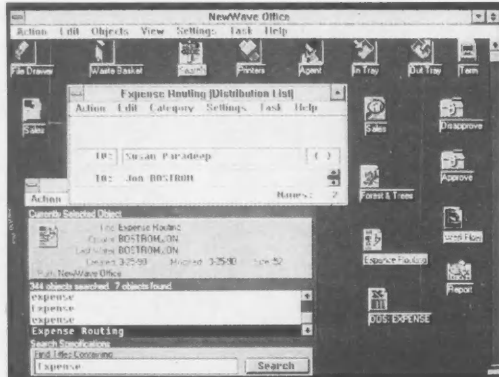
The new release includes support for Microsoft's LAN Manager and Novell, Inc.'s Netware and also incorporates Windows' memory manager, according to

Jim Grant, HP's product line manager for New Wave.

The release also has New Wave Access for image or SQL databases, which extracts data and enters it into PC application formats such as Lotus Development Corp. spreadsheets, said Mike Kelley, product manager for New Wave Office. There is also the addition of mail on PCs, whereas before, the mail module resided on servers.

The office modules range in price from \$200 for network services (which give PCs Network File Transfer, terminal access and connections to HP's mini-computers, along with complimentary LAN Manager software) to \$56,000 for HP Deskmanager (a distribution and messaging service).

In case New Wave users think they have missed something, there was no New Wave Office 2.0 release. Version 3.0 is actually the second release of New Wave Office — the company skipped a number to coincide with Windows 3.0, according to Grant.



New Wave Office 3.0's beta-test users said they find it handy for modular creation of executive information systems at a much lower cost than that of purchasing a full EIS product

TI seals James Martin deal

BY SALLY CUSACK
CW STAFF

LONDON — Texas Instruments, Inc. and James Martin Associates tightened their six-year working relationship last week when TI agreed to buy James Martin Associates' European information engineering business.

John W. White, president of TI's Information Technology Group, said the agreement will forge "closer working relationships and better meet the growing needs of the global CASE community."

The deal culminates a relationship between the two firms, whereby James Martin Associates' has participated in the development, marketing and distribution of TI's computer-aided

software engineering (CASE) product, the Information Engineering Facility (IEF).

Since 1988, more than 100 multinational, Europe-based companies have purchased IEF, which was developed by TI and based on an information engineering methodology that was developed by James Martin Associates' founder James Martin.

"No one industry is using CASE more than any other industry," Martin said. "The market for IEF has grown rapidly in Europe, with product sales exceeding \$50 million and consulting services exceeding that."

The agreement provides for an initial payment of approximately \$30 million, with subsequent payments based on performance during the next two years.

Paradox demo puts Borland right in Windows limelight

BY JAMES DALY
CW STAFF

SCOTTSDALE, Ariz. — Borland International, Inc. President Philippe Kahn demonstrated an early version of the Paradox for Windows relational database last week, offering users a surprise peek at a product analysts said could eat up the still-unclaimed Microsoft Corp. Windows database market.

Although Microsoft and Ashton-Tate Corp. have both promised a Windows-based database, the potentially lucrative market is still relatively untapped and serviced by products such as Superbase 4 from the smaller Precision Software, Inc.

"The Windows database world is open territory; the turf is there for Borland to own," said David Bayer, an analyst at Montgomery Securities in San Francisco.

Officials at Scotts Valley, Calif.-based Borland said they hope Paradox for Windows will follow in the slipstream of the character-based version, which has made strong gains against entrenched rivals. Ashton-Tate, for instance, has stumbled badly during the past three years trying to update its once-impregnable dBase program. Consequently, Paradox's market share has gone from 9% in 1989 to approximately 35% in 1990, according to Dataquest, Inc. ana-

lyst Marshall Moseley.

While neither the shipping date nor the price for Paradox for Windows was available, Kahn's run-through at the International Paradox User's Conference here highlighted several major additions to the package.

The graphics-rich application, code-named "Tsunami," will feature a new database engine architecture that allows applications to share data by snapping into a common "object layer." Such data exchange now requires traversing the Paradox database engine.

Current Paradox users were anxious to get their hands on the Windows version. "This is what DOS users have been dreaming about for years: a database that looks like the Mac," said Thomas Shasheen, director of information resources at the University of Michigan's School of Business Administration.

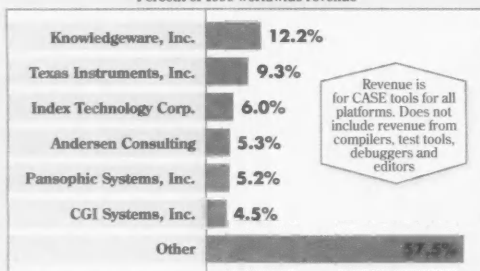
The new design will also allow users to directly access SQL Link, a Paradox Version 3.5 companion product that allows users to access remote SQL data without learning complex SQL programming. Currently, SQL Link must be accessed through the Paradox Engine, said Rob Dickerson, vice president and general manager.

Kahn said Borland plans to eventually extend the object layer concept to its character-based Paradox but would not say when.

Fractured market

The top six CASE vendors accounted for less than half of the estimated \$750 million market for CASE tools last year

Percent of 1990 worldwide revenue



Source: Strategic Focus

CW Chart: Marie Haines

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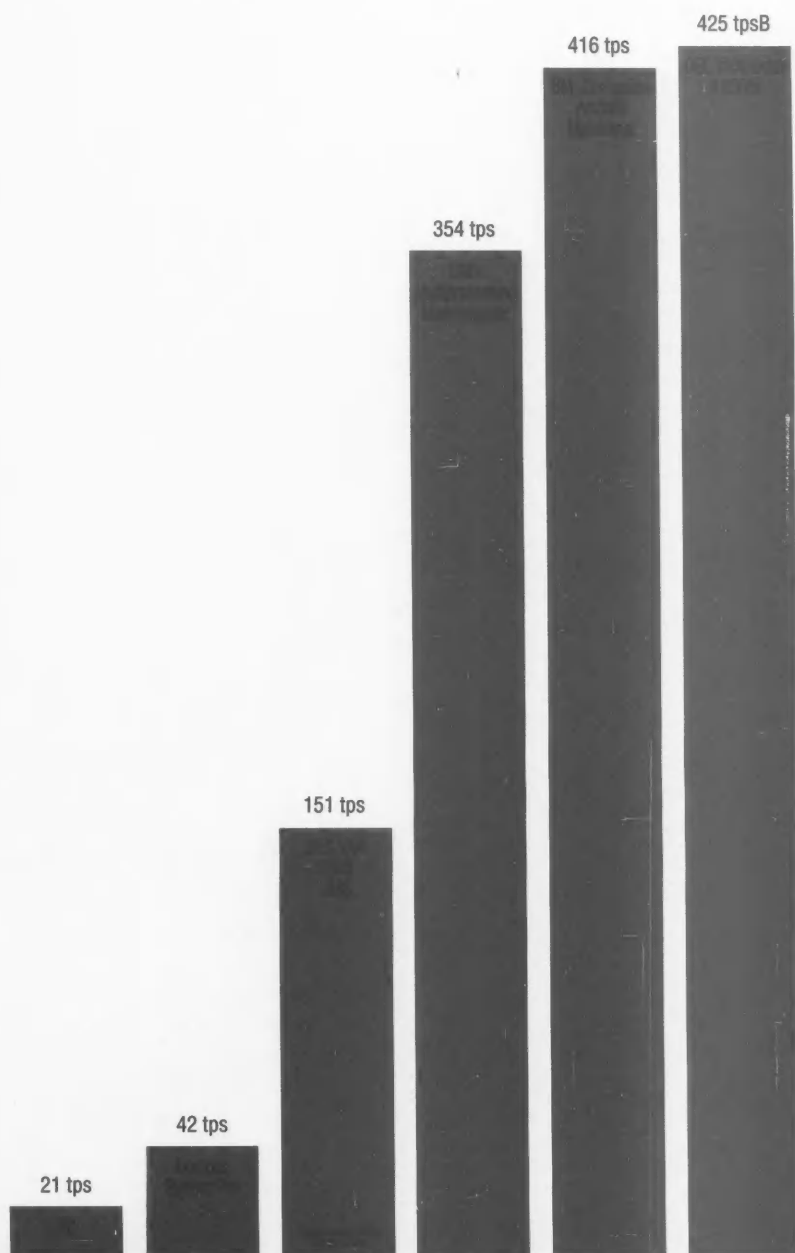
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Ace

FROM PAGE 1

prospect of yet another choice of RISC and Unix platforms.

"We already have two or three major efforts at standardization. This doesn't make it any easier for end users to understand where all this is going," complained James Sutter, vice president and general manager at Rockwell International Corp.

By mid to late 1992, the unlikely bedfellows hope to offer a RISC platform that can coexist on a network with Intel-based computers and run virtually identical versions of applications under either Unix or OS/2 Version 3.0, which will be based on Microsoft's New Technology kernel.

The ACE standard will be based on two hardware platforms: Intel Corp. 80386 and 1486 personal computers and Mips Computer Systems, Inc.'s reduced instruction set computing architecture.

The main job of the coalition is to provide a set of specifications for programming interfaces and systems components that any interested vendor can use as the basis for its own design. The lure for customers is supposed to be the wide swath of ACE-compliant applications that will run on either of the chosen platforms or operating systems with transparent interoperability.

"That is very exciting. I have a strong conviction that RISC is the long-term way to go," said Jerry Weinstein, director of cor-

porate MIS at General Instrument Corp. in Lyndhurst, N.J. "I'd really like to see a good alternative to Intel's more conventional scheme."

The task ahead

A key hurdle, users and analysts agreed, will be attracting enough software developers to write applications for the Mips RISC platform. Yet that should be an easier job because the ACE specifications call for source-code compatibility across the Intel and Mips platforms.

"I really like the idea of being able to order shrink-wrapped software and know it can run on a lot of different platforms," said Joe Archer, vice president of applications development at Colonial Management, an investment firm in Boston.

Archer noted that the Unix porting work he has done between Ultrix applications and SCO's Open Desktop is more work than vendors admit. "They don't spring out of the box and run everywhere," he said. "Compatibility is something you have to work with a bit."

Analysts expressed doubt that the group would pose any short-term threat to Sun, IBM, Hewlett-Packard Co. or any other well-established vendor in the RISC workstation market. They noted that ACE has no formal organization, no visible funding, a host of potentially conflicting agendas and a fuzzy time frame.

"They'd better have a machine in '92, or it's not going to matter much," said Amy Wohl, president of Wohl Associates in Wynnewood, Pa. "Sun's not

planning on standing still."

"The end of '92 is a heck of a long way away," agreed Tom Pettibone, senior vice president at New York Life Insurance Co., which is moving forward with development on SunOS systems, IBM's AIX Unix variant and AT&T's Unix System V. "A lot of us are deciding on RISC architecture as we speak."

While the consortium aims to establish a new desktop standard, users are a lot less willing to leap into new technologies without a careful analysis of the costs involved.

"I'm always skeptical when they say they're going to maintain your investment in whatever you have," said William Tignanelli, vice president at Federal Reserve Bank in Baltimore, a Compaq customer.

ABCs of ACE

The technical foundation for ACE is a dual hardware architecture with two distinctly separate operating systems. Yet the 21 companies in the ACE initiative are pledging a high degree of interoperability through software written in the portable C language.

With the goal of producing a broadly supported, open computing environment and initial products hitting the market in 1992, the ACE specification will encompass the following:

- Two hardware platforms. On the personal computer side, the platforms are the industry-standard Intel Corp. 80386 and 1486 machines. On the workstation side, there is a RISC system from Mips Computer Systems, Inc., based on Mips' R3000 chip but later moving to the R4000 chip.
- Two operating systems with source-code compatibility that enables both to run on either ACE platform. One operating system will be Microsoft Corp.'s OS/2 Version 3.0, based on the New Technology kernel. The other will be the Unix-based Open Desktop from The Santa Cruz Operation, based on the Open Software Foundation's OSF/1 operating system and Digital Equipment Corp.'s Ultrix operating system.
- Connectivity with customers' existing environments through Unix connectivity services; support for Novell, Inc. Network, Microsoft LAN Manager and Banyan Systems, Inc. Virtual Networking Software networking services; and links to IBM's Systems Network Architecture and DEC's Decnet.
- Support for third-party PC expansion boards and peripherals; the standard 101-key keyboard; storage media and file formats. Both the Extended Industry Standard Architecture and Turbo-channel buses will be supported on the ACE platforms.

MARYFRAN JOHNSON

Consortium conundrum

The Advanced Computing Environment is headed by diverse groups of executives, each with their own agendas:



Bill Gates
Microsoft

"I'm not saying IBM will like what we're doing here. But this should give a boost to OS/2."



Robert Miller
Mips

"I believe at last count IBM has 12 different architectures they're supporting now. It's easy to add a 13th."



Rod Canion
Compaq

"This will be the predominant system for advanced computing within this decade."



Doug Michels
The Santa Cruz Operation

"SCO and other key industry leaders are making a commitment to a unified Unix operating system."



Ken Olsen
DEC

"I don't think Compaq has ever worked with anyone before, have they?"

DEC, Compaq stand to gain the most

BY RICHARD PASTORE
and MARYFRAN JOHNSON
CW STAFF

While the user benefits of the Advanced Computing Environment (ACE) coalition are debatable, the potential gains for the two co-founding box builders are

clear. For Digital Equipment Corp., the coalition's clout could finally establish DEC's Mips Computer Systems, Inc.-based architecture as an industry standard. Compaq Computer Corp., meanwhile, will have something to offer power-hungry users who will not take Intel Corp.-based systems for an answer.

When DEC chose the Mips reduced instruction set computing (RISC) processor over its own in-house-developed RISC chip, it was gambling that it could turn Mips into an industry standard. That has not happened yet, but it may with the added weight of the coalition members.

With some 2,000 Ultrix applications already running on the Mips R3000 chip, according to analysts, DEC may also have a much-needed leg up on the applications side in the market for ACE-compliant systems.

The genesis of the coalition came in talks between DEC and Mips, top officials at both companies confirmed last week. Once they had agreed to push the Mips chip as a RISC standard, the next hurdle was gaining Microsoft

Corp.'s support, which in turn brought in Compaq and The Santa Cruz Operation.

If the coalition should fail, however, DEC's reputation in the Unix workstation field will suffer a crippling blow, analysts warned.

Compaq stands to gain the attention of potential customers that may disdain Intel architecture in favor of Sun Microsystems, Inc., Hewlett-Packard Co. and rival IBM. Indeed, IBM's successful RISC System/6000 is butting heads with Compaq's high-end Systempro for some server duties, observers noted.

There is a perception among some users that RISC-based systems offer better performance. "Customers seem enamored of it," said Lorie Strong, Compaq's vice president of marketing. There is also a bias among corporate developers that Unix is a stronger development platform.

In addition, most Compaq sites have a mixed RISC/complex instruction set computing environment, which could benefit from ACE's proposed interoperability, Strong said.

Spin control

On the outside looking in at the Advanced Computing Environment group are industry executives with their own competing stakes in the RISC and Unix markets:



Ed Zander
Sunsoft

"It's a Unix vs. Microsoft issue. When the dust settles, no one will care about Mips."



David House
Intel

"If we fall on our face like Sun thinks we will, it will have a big impact. But that's not our game plan."



Franz Nawroth
Hewlett-Packard

"If they can pull it off, fine. But I have seen how long it takes for a group like this to agree on a common set of criteria. Look at OSF."



Peter Cunningham
Unix International

"Gates and Canion are saying, 'The PC marketplace is out of gas - but if you wait four or five years, we'll have a replacement.'"



Doug MacGregor
Solbourne

"Compaq will eventually find that DEC is going in a direction that they don't want to go."

Outsiders don't fear ACE

BY J. A. SAVAGE
CW STAFF

In the wake of the heralded Advanced Computing Environment (ACE) announcement, a peculiar calm permeated workstation vendors that were not party to the event.

Often mentioned by the ACE group but notably absent was Intel Corp., whose personal computer architecture will continue to be offered by Compaq Computer Corp. — which joined Digital Equipment Corp., Microsoft Corp. and others in an endorsement of the reduced instruction set computing (RISC) chip offered by MIPS Computer Systems, Inc.

David House, president of Intel's Microcomputer Components Group, said the company supported the software announcements that apply to Intel's architecture.

"There's a great need for an OS/2 that's 32-bit and supports multiprocessing, like Microsoft is promising with [New Technology] OS/2," House said.

Hewlett-Packard Co., IBM and Sun Microsystems, Inc. are believed to be most at risk from the ACE consortium. Nevertheless, both the Open Software Foundation (OSF) — pioneered by HP, IBM and DEC — and Unix International, which is closely affiliated with Sun, were associated with the ACE announcement, and as such, appeared to be turning against their founders.

The OSF was not involved with any of ACE's decision-making, according to an OSF spokeswoman, but its application environment specification (which is a programming interface to the OSF/1 operating system, the Motif graphical user interface and distributed computing environment) represents a key component of the Unix software strategy in the ACE plan.

"Our charter is to provide vendor-neutral enabling technologies," the spokeswoman said. "In the hardware world, the equivalent would be a 'design win.'"

HP downplayed any notion of an OSF

schism. "We're working with Sun already," said Franz Nawratil, vice president of worldwide sales and marketing. "We're working right now with System V.4," the operating system under the control of OSF rival Unix International.

Unix Systems Laboratories (USL) announced a reference product last week and defined an application binary interface for the MIPS microprocessor. That, according to a statement from the group, "will go a long way toward establishing the MIPS chip as the standard architecture for high-performance, open commercial computing in the '90s."

Sun originally worked with USL, "but the development partners are different now," according to a USL spokesman. "It does advantage and disadvantage everyone equally. It's not set up to advantage or disadvantage Sun," he said.

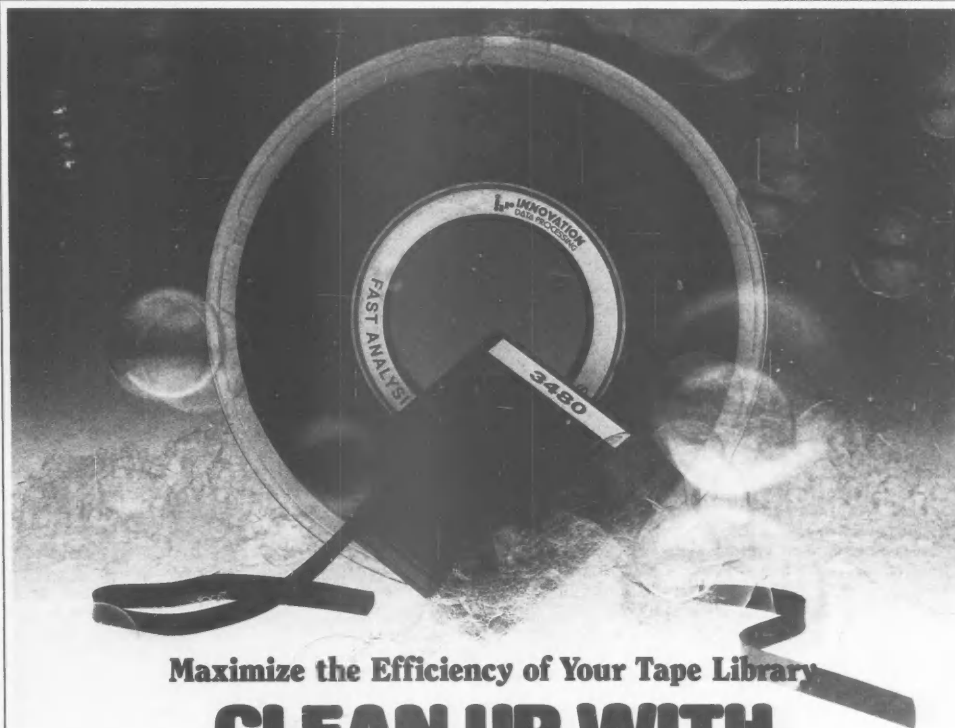
The announcement indicated there would be several operating systems for the basic MIPS RISC architecture, accordingly, both ACE and non-ACE vendors said numerous parts of the software part of the deal had to be ironed out.

"So many areas besides the operating system are necessary for binary compatibility of applications across hardware," said Doug MacGregor, president and chief executive officer of Solbourne Computer, Inc., whose products are based on Sun's architecture.

"You need compatibility at the graphics level, networking and look-and-feel. Those are big issues that have not been resolved [by MIPS] in the past, and I'm skeptical they will be resolved in the future," he added.

Bill Coleman, vice president of systems software at Sun, said the confusion may lead independent software vendors into deeper quagmires; thus, they may develop few applications. "If you are an [independent software vendor] and looking at four or five different versions of the software and no big volume on any of them, what will you do?"

Non-ACE vendors also offered the opinion that the mere presence of ACE could boost the RISC market in general by endorsing RISC architecture.



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The ACE lineup

Other computer firms participating in ACE include the following:

- The Acer Group
- Control Data Corp.
- Kubota Corp.
- NEC Corp.
- NKK Corp.
- Olivetti USA.
- Prime Computer, Inc.
- Pyramid Technology Corp.
- Siemens AG/Energy and Automation, Inc.
- Siemens Nixdorf Information Systems, Inc.
- Silicon Graphics, Inc.
- Sony Corp.
- Sumimoto Electric Industries Ltd.
- Tandem Computers, Inc.
- Wang Laboratories, Inc.
- Zenith Data Systems

NEWS SHORTS

DEC plans 250 layoffs . . .

Digital Equipment Corp. last week confirmed it will lay off 250 more employees as part of its cost-cutting effort to trim 6,000 employees from the payroll by June. The Maynard, Mass.-based firm is disbanding its media communications group in favor of contracting out for those services.

. . . also eyes parallel processor

DEC is expected this month to announce a joint venture in massively parallel computing. DEC reportedly will unveil an agreement to sell software running on massively parallel systems from Maspar Computer Corp. DEC will provide a Pascal compiler, computer-aided software engineering tools and a front-end workstation.

CGI to ship repository tools

CGI Systems, Inc. said last week it will soon ship tools that work with Repository Manager/MVS, the core piece of IBM's AD/Cycle. CGI Systems is not a key AD/Cycle business partner. However, it is one of the few third-party providers to announce tools for direct use with the IBM repository. Of the several AD/Cycle inner circle vendors, only Knowledgeware, Inc. offers a tool that links to the IBM core software.

EMC introduces AS/400 add-ons

EMC Corp. last week unveiled a range of storage products for the midrange IBM Application System/400, along with remote maintenance and performance analysis services. The products are an advanced hard-disk subsystem, the EMC SL/936 and an 8mm tape backup subsystem. EMC claims its products store more data and outperform comparable devices from IBM, such as the 9335 and 9336 disk drives.

Ashton-Tate ships Macintosh tool

Apple Computer, Inc. Macintosh database users got another ally last week when Ashton-Tate Corp. began shipping Dbase IV Runtime Plus, a product that runs most Dbase IV Version 1.1 applications without modification on the Macintosh. The \$195 program gives Macintosh users access to thousands of Dbase applications created in Dbase IV for DOS, Unix or DEC's VMS, according to Ashton-Tate officials.

HP plans MPE upgrade

Hewlett-Packard Co. last week revealed that it plans to release the next version of its MPE XL operating system at the end of next month. MPE XL 3.0 will include 25 new products, including automatic backup and retrieval and systems management that will run on any PC in the network, according to Richard Sevcik, general manager of HP's Commercial Systems Division.

Compaq bows out of Comdex

Compaq Computer Corp. will give up its booth at Fall/Comdex '91. The Comdex show, because of its size, clutter and expense, is not the most effective way for Compaq to reach users this year, a Compaq spokesman said. Compaq will exhibit at smaller, narrowly focused trade shows, he said. Compaq will maintain an equipment-testing room for its independent vendor partners as well as press briefing rooms at Comdex.

Lowrance resigns from Amex

American Express Co.'s chief technology planner is leaving to take a job in the consulting field. Roy Lowrance, vice president of technology strategy at American Express, plans to begin his new job next week. He will work at Boston Consulting Group, Inc.'s New York office. "The allure of consulting is that it provides a chance to effect positive change in a variety of organizations," he said. Before joining American Express three years ago, Lowrance was at McKinsey & Co. as director of systems consulting for financial services firms.

More news shorts on page 104

Windows in Unisys' CASE plan

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Unisys Corp. last week announced its very own grand strategy for computer-aided software engineering (CASE), a repository-based scheme similar to IBM's AD/Cycle that includes products and strategic alliances with third-party vendors.

The Advanced Solution Development (ASD) framework spans the breadth of Unisys' product lines.

In the short term, ASD promises users the ability to update Unisys applications with graphical user interfaces and provides enhanced versions of Unisys' Ally, Mapper and Linc development tools.

In the long term, ASD calls for an object-oriented repository, which can reside on a workstation, server or mainframe but

does not require the mainframe to operate, said Scott Miller, program marketing manager. That plan is set to come to fruition in 1995, and Unisys' repository will "interoperate" with those from IBM and Digital Equipment Corp., he said.

Unisys will make available in August a personal computer-based tool called Designer Workbench, which runs under Microsoft Corp.'s Windows 3.0 and is the company's first implementation of its object-oriented repository, Miller said. Unisys will offer repository products for its A series and 2200 mainframes in the next few months.

The mainframe and PC products differ in that the mainframe repositories are not object-oriented. Miller said the need for repository products for Unisys' Unix line will be addressed during the next few years.

Unisys' ASD plan will also

take into account applications written in Cobol, and the company is providing interfaces to some popular third-party CASE tools such as Index Technology Corp.'s Excelerator and Knowledgeware, Inc.'s Information Engineering Workbench.

Users and analysts reacted positively to Unisys' plan but said there are some issues to be addressed, such as the transition problems that may be encountered as users move from current repository products to what Unisys will be developing during the next several years.

John DiFranzo, vice president of information services at Westinghouse Broadcasting Co. in Milford, Conn., said that the announcement "allows us to put an updated user interface on our existing applications. We'll be looking at Designer Workbench and also at their planning and maintenance tools."

IBM posts first quarterly loss in history

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — Worldwide economic woes and a onetime accounting charge last week dealt IBM the first quarterly loss in its history. Numbers posted for the first quarter of 1991 showed a net loss of \$1.7 billion in contrast with last year's \$1 billion first-quarter profit, on revenue down 4.5% to \$13.5 billion.

The loss was an accounting anomaly, however, as the firm took a nonrecurring, \$2.3 billion charge against earnings in connection with adoption of an accounting principle that requires U.S. firms to reflect on their balance sheets the fair market value of nonpension retirement bene-

fits for all employees.

On a pure operations basis, IBM showed a \$500 million profit for the quarter.

While firms can opt to amortize the huge expense over 20 years, IBM "chose to bite the bullet up front — a smart move," said Martin Ressler, an analyst at Duff & Phelps Investment Research Co.

The operations-related figures fell within the range IBM cited last month, when it sent the stock market south with the warning that first-quarter results would underperform Wall Street expectations by 50%.

Chairman John Akers reiterated last month's statement that the dismal numbers are attributable to the economic slowdown.

Ressler differed, saying, "They keep emphasizing that all product lines, geographies and customer categories are impacted as evidence that none of the problems are coming from inside. But what I see is that IBM doesn't seem to be outpacing the market anywhere."

All hardware product lines "were impacted," an IBM spokesman said. However, he added, "the RISC System/6000 workstation line was impacted somewhat less than the others."

John Jones, an analyst at Montgomery Securities, took a more upbeat view. "Software was up 14%, support, 19% and rentals up 16% — those are fairly healthy gains, especially during a recession," he said.

Microsoft

FROM PAGE 1

The FTC letter, released by Microsoft, indicated the agency would require access to documents dated prior to the January 1988 cutoff date the FTC had apparently set earlier. The agency directed Microsoft not to destroy any original documents.

Although no company contacted last week would acknowledge that it had complained to the FTC, several Microsoft competitors, including Lotus Development Corp. and Digital Research, Inc., said they have been contacted by FTC investigators.

"We're pleased and will support the authorities as they request," said Dick Williams, president and chief executive officer of Digital Research, which sells an alternative to MS-DOS. "Mi-

crosoft competes unfairly and has been doing so for a lengthy period of time," he charged.

Microsoft was "surprised and disappointed" at the expanded probe, but it will continue to cooperate, said Marianne Allison, a public relations representative. "It has been noted that the FTC has not had a good track record of successfully prosecuting monopoly cases," she added.

But the probe is likely to drag on for several months. "It will take us at least until the fall to produce all the documents that are required for this," Microsoft spokesman Marty Taucher said.

The overarching issue for the software development community is whether Microsoft unfairly uses its position as purveyor of the standard PC operating system to seek dominance in applications as well.

"It's clear that Microsoft

wants to be the IBM of the software industry," said Carole Patton, editor of "Acknowledge, the Window Letter," a Mendham, N.J.-based newsletter. "It's a super strategy; it's just that they don't implement it with sensitivity."

Last November, a small Pomona, Calif.-based firm called Z-Nix Co. filed antitrust charges against Microsoft, claiming the software giant was trying to muscle Z-Nix out of the mouse input device market. The case was settled.

"A lot of companies feel that Microsoft competes unfairly because they have firsthand information when it comes to Windows development," said Frank Yeh, vice president of sales and marketing at Z-Nix.

West Coast correspondent Jim Nash contributed to this report.

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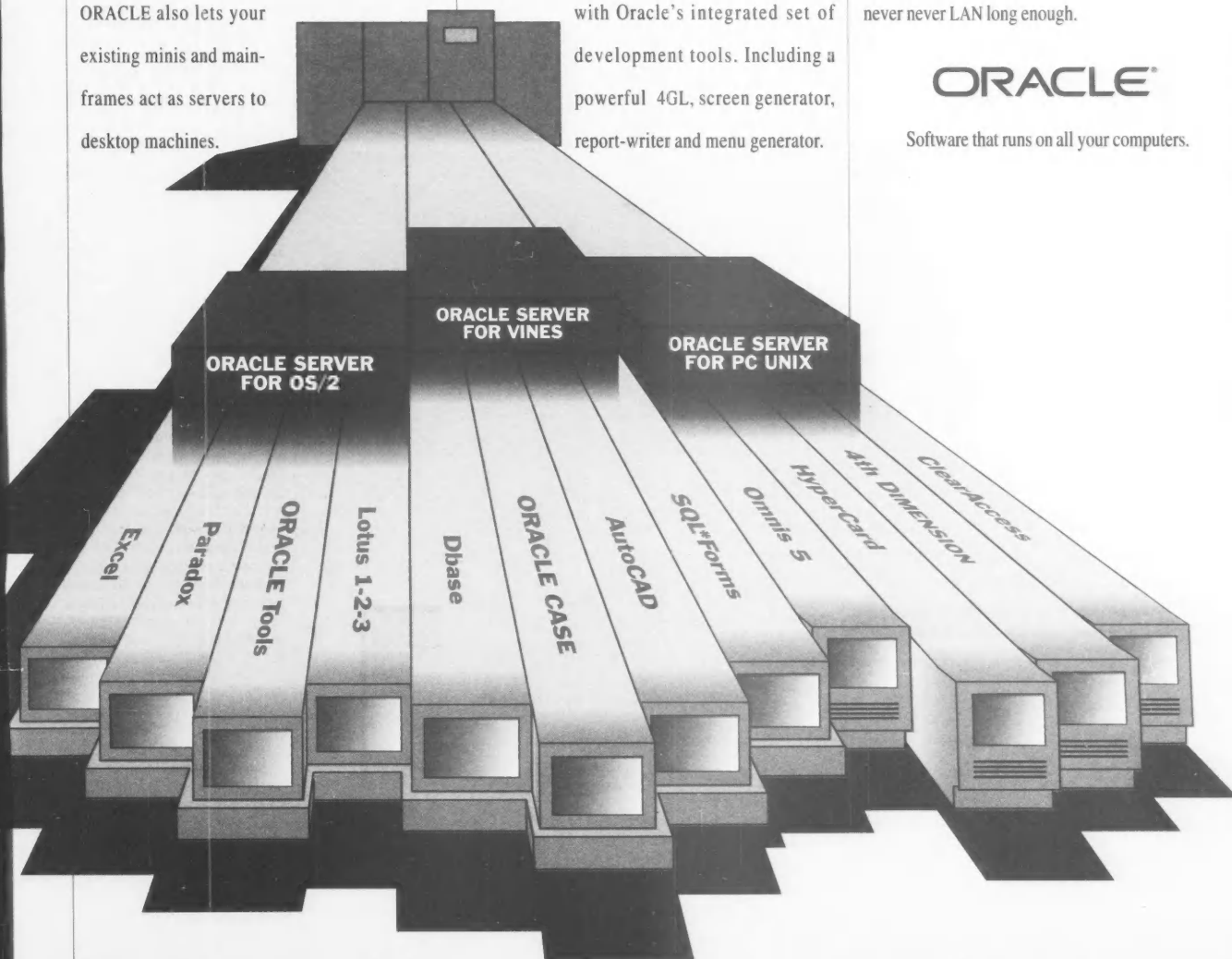
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DEC airs low-end LAN connector

BY JOANIE M. WEXLER
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. introduced a wiring concentrator last week that could make networking palatable to anyone handy enough

to hang a print of "Whistler's Mother."

Based on an \$890 portrait-size hub backplane that hangs on two screws in a wall, the low-end product line interconnects and centrally manages work-group-size Ethernet local-area net-

works. The hub and its terminal server, bridge and repeater modules are targeted at companies looking for simple LAN connectivity with network management capabilities but that are unwilling to pay for full-blown smart hubs supporting other

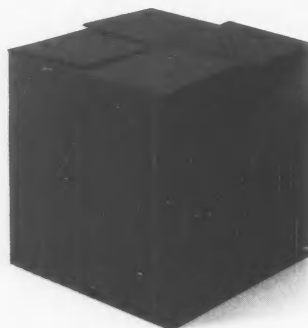
LANs and functions.

Janet Hyland, director of network strategy service at Forrester Research, Inc., said Forrester surveys indicate that most companies are buying hubs for their manageability, not for all of the extra functions. "That means that with high-end products, customers pay quite a premium if all they want is management," she said.

One beta-test user said DEC's products will probably make some hay with neophyte LAN administrators. "A large percentage of Ethernets consist of 25 workstations or less," said Paul Parker, supervisor of network services at Carnegie Mellon University in Pittsburgh.

"Those LANs probably don't have a network guru dedicated to them," thus the appeal of the simplicity, he said.

DEC's hub backplane can be installed in about 30 seconds. The initial modules that plug into it include a \$1,450 eight-port



Room to play

DEC is reaching beyond its installed base to the growing market for Ethernet connections requiring SNMP management

Low-end managed hub*
U.S. revenue projections
(in millions)



Source: Forrester Research, Inc.

terminal server, two \$1,590 repeaters for operation over unshielded twisted-pair or thin coaxial wiring and a \$2,890 manageable bridge slated to house a Simple Network Management Protocol (SNMP) agent within six months.

Open support

Coming support of the widely used SNMP was lauded by users and analysts for making DEC more "open." However, one remaining question about the product's popularity in non-DEC shops surrounds the new terminal server's support of only DEC's proprietary Local-Area Transport (LAT) protocol. LAT was originally designed for DEC terminal servers to provide communications among DEC terminals across an Ethernet LAN.

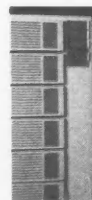
While DEC is now licensing LAT to about 40 other vendors, many terminal server users — including Parker — require Telnet, a terminal emulation utility for Transmission Control Protocol/Internet Protocol networks.

Rather than taking the traditional form of printed circuit boards, all the hub modules are videocassette-size devices that can be removed from the backplane and placed wherever is convenient. When purchased as hub modules, the price of the units drops slightly.

The Dechub 90, Decbridge 90 and Decserver 90L are available immediately; the Decrepeaters are scheduled to ship in three months, DEC said.

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Wang reinforces VS operating system

Offers additional storage, connection enhancements to proprietary line

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. rolled out a new operating system and several storage and connection enhance-

ments for the VS line, to the relief of some of its principal customers.

"This is a direct response to our client needs — as long as customers want to be on VS, we will be there to build and support

them," said Gerry Paul, vice president of systems and communications at Wang.

The latest version of the VS operating system, designated 7.30.04, enables as many as 998 workstation devices to be con-

nected to the VS 8000 and 10000 families of systems. The previous version, 7.30.02, supported 512 devices.

Additional support

The operating environment also supports up to 512 active workstation tasks on a high-end VS.

Jim Holsopple, manager of data processing at Goshen Rubber Co. in Goshen, Ind., charac-

terized the announcement as "timely."

"We are sitting at approximately 230 tasks right now and have already maxed out our VS 10000 Model 50," he said.

Goshen Rubber runs Wang imaging applications for blueprint and documentation quotations and currently has 105 users connected to the system.

At the Gas Research Institute in Chicago, Peter A. Cangelosi, manager of data processing services, said the organization has evaluated the operating system and is in the process of developing a conversion plan.

Cangelosi said the Gas Research Institute has "hit the limit," running the VS 7.21 operating system on a VS 10000 Model 50 machine.

"The new versions will allow us to manipulate memory better

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THIS IS A direct response to our client needs — as long as customers want to be on VS, we will be there to build and support them."

GERRY PAUL
WANG

and give us significant upgrades in terms of connectivity," Cangelosi said.

Wang also announced Extended Serial Device Support and the VS Mass Storage I/O Subsystem. The Extended Serial Device Support software doubles the number of physical and logical devices that can be configured on serial I/O controllers in a high-end VS environment.

The subsystem includes two I/O controllers, two small computer systems interface (SCSI) tape drives and four SCSI disk drives.

These announcements follow Chief Executive Officer Richard Miller's six-page letter to customers earlier this month, which was billed as the first installment of Wang's Office 2000 strategy.

While the letter made little mention of the VS base, Miller stated in an interview that VS customers could expect more in terms of "price/performance upgrades and connectivity."

John Hosanna, manager of technical services at Natural Gas Pipeline Company of America in Houston, uses the VS in conjunction with Wang's newer Open/Server products to connect personal computer local-area networks to five large VS systems.

Hosanna said he is pleased with Wang's proprietary and open product lines. He plans to look at the vendor's Dynamix series of Unix-based PCs eventually, he said.

More Office 2000 announcements are expected this week.

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*Gartner Group's *Software Management Strategies*, P-480-866, "LEGENT's ASO Products Take the Lead," 8/29/90.

LEGENT

A high-tech salute to vets

Country Joe McDonald starts on-line, interactive memorial

BY J. A. SAVAGE
CW STAFF

BERKELEY, Calif. — *Gimme a V! Gimme an E! Gimme a T! What's that spell? What's that spell?*

That slightly different version of Country Joe McDonald's most famous antiwar cheer from Woodstock could be the theme for his latest project: a veterans war memorial. But this memorial is not carved from granite. It is a veterans database residing on publicly accessible terminals for interactive use.

Set to be completed by Veterans Day, Nov. 11, the Veterans Memorial project will contain the names, ranks and death information of approximately 2,000 Alameda County service people killed in World War I, World War II, the Korean War, the Vietnam War and the Persian Gulf war.

"In the '80s, I got reinvolved with war after requests from veterans' groups to provide entertainment," said McDonald,

a Navy veteran who currently sports a straw hat with a yellow ribbon and enamel flag pin. He started planning for a physical memorial, along the lines of the typical



Rykodisc USA

Country Joe helped create an interactive veterans memorial

statue to be erected in a new park in the city.

"But there were problems: People would have to physically go to it to participate, and it cost a lot of money," McDon-

ald said. He hooked up with a community database outfit called Community Memory [CW, Oct. 8, 1990], which provides publicly accessible terminals in laundromats, senior citizen centers and libraries.

With the help of 10 volunteers, information about veterans is being entered into the community database. Users can add their thoughts, additional information on the dead, poems or whatever.

Community Memory, a nonprofit group, was one of the first developers of relational databases in the early 1980s. The organization has an Intel Corp. 80386-based IBM Personal Computer clone running AT&T Unix System V as a server and 10 diskless clones in the field for user access. I/O and database management are done on the server, while the PCs manage screens. Leased lines provide data transfer with a packet-switched network through limited-distance modems to increase efficiency.

While McDonald came up with the idea of the Veterans Memorial Project, he left it to Community Memory to set up the program. "I'm not a computer person," he said. He is continuing to pursue a physical memorial in the park, but his new design includes a public terminal.

A plethora of promises

Among the developments Banyan officials promised the Association of Banyan Users at their conference last week in Montreal were the following:

- LU 6.2 IBM host connectivity to Vines servers within 60 days.
- "Imminent" Vines support of Macintosh clients.
- Eventual support of Unix clients.
- A restructuring of the Vines developers' conference to attract more applications development for the network.
- Third-party subscription service for Banyan technical bulletins.

Vines users worry about Banyan

BY JOANIE M. WEXLER
CW STAFF

MONTREAL — Vendor viability worries tempered user enthusiasm for the rollout of Version 4.10 of Banyan Systems, Inc.'s Vines local-area network last week at the Association of Banyan Users meeting.

Marketing and political concerns voiced by the fiercely loyal and technically adept Vines community drowned out the pros and cons of Banyan's Virtual Networking System (Vines) capabilities. Several users agreed that large-customer-oriented Banyan must shift to a "bottom-up" approach and be willing to sell into smaller accounts to grab market share and collect the cash it needs for continued product development.

This is a tactic that has accumulated about 55% market share for major competitor Novell, Inc. and ironically has seen

some large Novell users complain they are often shortchanged for the needs of smaller customers.

However, "Novell has a huge presence and is getting the products out that their customers need," said Carol Ann Feder, LAN systems consultant at the University of Michigan.

In contrast to the publicly held, resource-rich Novell, the \$100 million Banyan is a private company garnering about 5% market share. While the 6-year-old firm's account list reads like a "Who's Who" of corporate America, the fact that "it's 1991, and Vines doesn't have more market share is incredible," said Jim U'Ren, LAN services manager at Jet Propulsion Laboratories.

Vines users expressed to Banyan executives the difficulty they experience selling the Vines concept to upper management because of Novell's widespread "mind share."

One Banyan customer has elected to use a third party's electronic mail package on Vines rather than Banyan's E-mail package "so that if Banyan doesn't make it, the E-mail interface won't change," said Gary Wilson, a network manager at Ortho Pharmaceuticals Corp.

In addition, some users want direct service and support from Banyan rather than from resellers who often "are not trained to remedy problems and install software patches," said Alois Morhart, vice president of the Banyan Users Group in Germany.

Banyan is scrambling to be responsive. President David C. Mahoney stressed the importance of imminent strategic alliances with other companies to allow Banyan to gain the resources it needs to satisfy customers.

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ADVANCED TECHNOLOGY

Who is liable? Just ask the experts

Damage caused by knowledge-based systems could lead to lawsuits that target everyone involved

BY MICHAEL ALEXANDER
CW STAFF

Here is a quick multiple choice test:

If a knowledge-based or expert system failed in some way and caused personal or economic injury to an individual or organization, who would be the likely target of a liability lawsuit?

A. The developer who created the system's shell.

B. The expert who supplied the system's knowledge base.

C. The user who placed too much faith in the system's output.

D. All of the above and probably a number of others to boot.

The correct answer is D, according to several legal experts.

"I would sue everybody, jointly and severally," said David Newman Jr., an attorney and associate professor of electrical engineering and applied science at George Washington University.

A lawsuit based on injury caused by a knowledge-based or expert system has yet to make it into court, but the legal community "is just waiting for a case to happen," Newman said.

Unaware of risk

Designers of expert systems and end users who rely on their efforts are unaware of the risk they face should the system fail. Vendors who create the system's shell are also at risk even though they have little control over how the system is used or who uses it, the legal experts said.

"If you're designing a system that

is going to be used for an application that has significant exposure to damage or loss, you have a degree of responsibility of identifying how the knowledge system is put together," said Richard Bernacchi, an attorney and computer law expert at Irell & Manella in Los Angeles.

The system designer and users can protect themselves to some extent by documenting the care they take in selecting a product before putting it to use. That care should include a complete evaluation of the product and a reference check with current users. "Let the buyer beware," Bernacchi said.

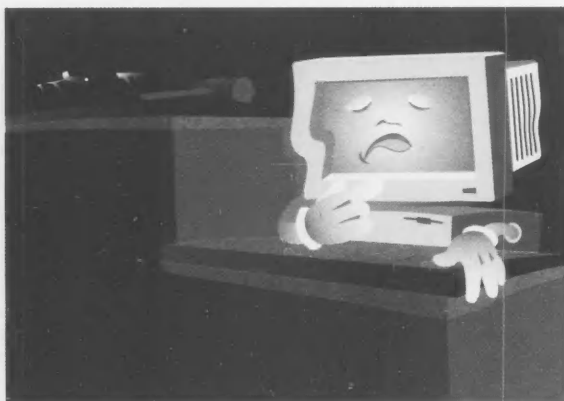
Despite the liability risk, sellers and buyers are not particularly cautious when working with expert systems, said Larry Harris, founder and chairman of AI Corp., a Waltham, Mass.-based developer of knowledge-based system tools.

"Someone has to get burned first" with legal action before attitudes change, he said.

The liability issue is a concern to the industry in general but probably affects designers of vertical applications more than the developer of the tools used to create the system, Harris said.

"It is not different than writing a medical book," Harris said. "I don't think that a doctor can sue the author of a medical book; it is still the responsibility of the doctor who makes the diagnosis."

Such disclaimers would probably not prevent a lawsuit or hold up in court, legal experts said. The vendor



Ray Vela

could be liable in ways never before imagined: End users could attempt to use the product in unforeseen ways or simply decide not to take training courses offered by the vendor, for example. In either case, the vendor could be in the docket alongside the other defendants, according to legal opinion.

Take precautions

There are precautions that vendors should consider, Bernacchi said. "One thing that would help considerably is to document the testing process." A show of reasonable precaution will help offset any legal action.

Even so, legal experts said, it is only a matter of time before a malfunctioning knowledge-based system triggers a lawsuit. When that hap-

pens, everyone involved in the creation of the knowledge-based system could face the prospect of legal action.

The suit could be on several grounds, ranging from breach of contract to negligence. "Would I win on every ground?" Newman asked. "It doesn't matter. If I win on one, I would get whatever I went after for my client."

The liabilities will also vary according to whether a knowledge-based application is determined by the court to be a good, a service or a combination of the two.

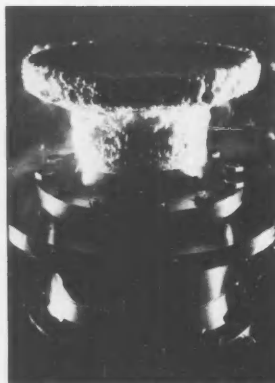
"That can make a difference in the sense that some jurisdictions have different ground rules whether certain legal principles apply in case of service as opposed to product," Bernacchi explained.

Carrier device makes for supercool conductivity

BY MICHAEL ALEXANDER
CW STAFF

Carrier Corp. has introduced what may be the coolest technology yet for advanced electronics and superconducting devices. The company recently unwrapped a compact cryogenic cooler capable of maintaining a chilly -321 degrees Fahrenheit.

The cryocooler makes it possible for computers, communications equipment and manufacturers to use superconducting devices in a wide variety of applications, according to Carrier. Superconductivity is a phenomenon that occurs in many electric conductors when chilled to extremely low temperatures. The electrons undergo a transformation that causes the resistance to the flow of electric



The amount of cooling is determined by the size of the cold head shown here

current to vanish, among other effects.

Computer and defense industries are the most immediate and largest markets for the device, said Gerald Robertson, director of advanced electronics cooling at the Carrier Transicold Division in Syracuse, N.Y.

The unit could be used to cool complementary metal-oxide semiconductor chips in minicomputers, for example, Robertson said. "You can get a speed increase of a factor of two." The cooled chips have also been found to be more reliable.

Researchers working on high-speed computer technology are attempting to develop computers with circuits based on superconductivity and a technology called the Josephson effect. Modern high-performance synchronous computers have operating cycle times between 12 and 60 nsec. Superconducting and Josephson technologies could reduce the cycle times to below 4 nsec and eventually to subnanosecond cycle times. Reliably cooling the computer to temperatures as low as -452 degrees Far-

enheit is one of several challenges that researchers are now trying to resolve.

Satellite and other communications equipment could use superconductivity to boost the performance of communications switches, transmission lines, filters, parametric amplifiers and other related components.

The technology is also being explored for use in space, defense, medical instrumentation and magnetically levitated trains, among other areas, Robertson said.

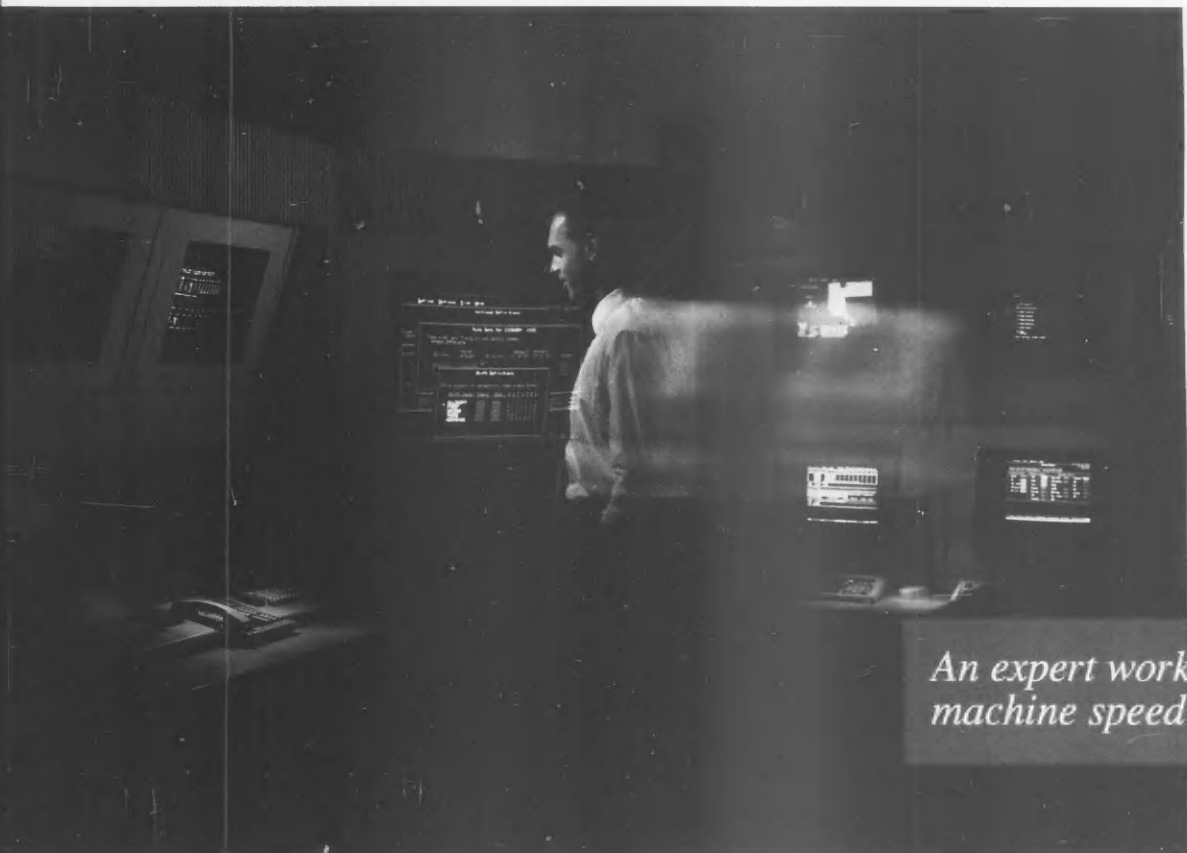
"We see the market for the cryocooler to be fairly large," Robertson said. "We're anticipating a \$100 million market to emerge by 1996."

The cryocooler, which has been in development since 1989, employs a Stirling cycle compressor that uses helium as its refrigerant rather than chlorofluorocarbons.

The cooler's base measures about 17½ by 29 inches. Its height varies according to the size of the cold head, where the cooling takes place.

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EDITORIAL

United they fall

IF THERE IS anything to be said for the historical performance of computer industry consortia, it is this: Either they fall far short of the tremendous hype that greets their introduction, or they just plain fall.

This is not an opinion as much as it is an observation. Remember Trilog? If you don't, that's because it died so quickly, but not before several big vendors poured a quarter of a billion dollars into an effort to rewrite the book on processor chip design. Almost symbolically, the prototypes flamed out.

How about Sematech, the purported American answer to Japan, Inc.? That effort even dipped into tax dollars before fizzling last year.

And while it may be considered unfair to utter the Open Software Foundation (OSF) in the same breath as these chip blips, one could certainly make a case that the OSF is still leagues away from all the promise that was suggested at its grand unveiling, which featured the likes of Ken Olsen, John Young, John Akers et al holding hands onstage for the cameras and talking of the brave new world of Unix that the OSF would foster.

Enter now yet another consortium, the Advanced Computing Environment (ACE), which promises nothing less than to redefine and recast the hottest hardware market in the computer business, the RISC workstation market.

The group is led by some mighty big names — Microsoft, DEC and Compaq. Microsoft is supposed to build the software bridge between the Intel and RISC worlds. Today, it has no presence in the workstation market. Neither does Compaq, though it would like one. And DEC's workstation market share is falling.

But there is a plan: Through their collective strength, the consortium members will rope the software developers into the ACE camp, maybe even away from Sun, HP/Apollo and IBM (which collectively sell three out of four workstations today). There are a few catches, such as the fact that ACE won't have all the component parts of its systems for a few years. But what's a few years in this business? A lifetime maybe for some customers.

And what about the customers? Has anyone asked what they want? No one asked them what PC standard they wanted 10 years ago, but they cast their dollar votes for the IBM standard, and all those other great PC solutions, save Apple's, went away.

Therein lies one of the probable seeds of demise of so many joint efforts. They purport to be acting on behalf of the customer, yet clearly the attempt is to serve individual market share needs first, ignoring the implicit customer demands the market has reflected.

No matter what the final outcome of ACE's efforts, one fact will remain perfectly clear: Customers set standards, not vendors — not IBM, not Compaq, not Microsoft. If ACE's goal is in fact to "set a computing standard," the group is doomed as fast as you can say "Sematech."



LETTERS TO THE EDITOR

Trial and error

The March 11 editorial, "Rule of law," misstates what happened in the Lotus/Paperback 1-2-3 copyright case. The Lotus ruling was not based on "usurpation of program code." Paperback, in fact, revised an existing spreadsheet program to be compatible with 1-2-3 by incorporating most of the menu text and the abstract command hierarchy that ties the menu actions together. Had the case merely involved the copying of code — or even the modification of code — it would have been much simpler. Rather, like the Apple/Microsoft case, it involved whether and to what extent copyright law extends to "nonliteral" elements, going beyond the program itself to what the program produces and how it behaves when it is executed.

My concern is that the court may not be able to find that "elusive win-win" to which you refer. In fact, more and more people in my profession are coming to the view that we may need a broad legislative re-examination of the underlying fundamental principles in order to sort out this and many related issues.

Ronald Abramson
Hughes Hubbard & Reed
New York, N.Y.

sions spend many long days at the office (and later at home). The pressures of projects, fire fighting and personal efforts to achieve valuable results for our institutions belie the perceived idea of a laid-back respite in an "ivory tower." Whether in administrative computing, networking or academic computing, we work with many of the same vendors as our counterparts in business and do the same strategic planning and daily operations. Such things as chargeback, project cost/benefit analysis and the normal budget process are all handled by those of us in academia.

We devote our professional lives to this occupational choice for varied reasons. As with some faculty and university administrators who could make more money from employment in private industry, many of us do it for the less tangible rewards of helping the educational system and the future embodied in our students and to be challenged in an environment of ideas and activities that abound on both small and large campuses.

John Neubert
Director, Academic Computing
Drew University
Madison, N.J.

Closed minds

The comments attributed to William Joy in your "Inside Lines" column [CW, March 11] are typical of those from many individuals who have learned to use one particular computer operating system or architecture and no other. These comments demonstrate an extremely poor understanding of the relative merits of the diverse tools available for solving computer-related tasks. Imagine asking a contractor,

"Which is the 'best' hammer?" The answer should vary according to the task at hand. Mr. Joy's comments display the narrow-minded view that so frequently leads end users to be saddled with a sledgehammer when more appropriate tools may be more commonly or economically available.

Among the computers available for my use are high-powered mainframe computers running the Unix operating system, minicomputers (yes, Bill, even Sun Sparc servers with lots of RAM and multigigabyte drives), Intel-based PCs of all persuasions and Macintoshes.

The provincial attitude displayed by Mr. Joy is one that I have often encountered among my peers, some of whom are DEC VAX gurus, Macintosh gurus, Unix gurus, PC gurus, ad nauseum. And it makes me sad, particularly for the less experienced user who may seek out the advice of these "experts."

No one is born knowing about this stuff, but those who seek to expand their horizons in this complex field would do well to take the advice of such computer bigwigs with less than a grain of salt.

Michael W. Lurie
Computer-Aided Design
Systems Engineer
CAE-Link Corp.
Binghamton, N.Y.

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Academic IS

The comments of Miami-Dade Community College's director of computer services, Albert L. LeDuc [CW, March 11], concerning the stresses and responsibilities in computing in higher education were right on the button. Computing in academia is very similar to that in private industry. Those of us dedicated to our mis-

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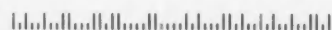


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Where the public draws the line

Consumers are learning they can say 'no' to invasions of privacy

JANLORI GOLDMAN



A targeted mailing arrives at your door: "Congratulations, Ms. Jones, on your new raise. You'll be needing it since you've just bought a new home and a car and had a baby last year. Wondering how you'll afford your third trip to Barbados? Or how you're going to pay that huge mortgage? Have we got a deal for you."

The core principle of privacy laws is that information collected for one purpose may not be used for another purpose without the individual's consent. Thus, a detailed financial history you provide to obtain a mortgage should not be used later by a marketer unless you give your permission. However, in areas not yet regulated by privacy law, such as most marketing activities, personal information obtained in one transaction is routinely sold for a second profit without the person's knowledge or permission. The information travels from database to database, eventually making up what one commentator dubbed "a womb-to-tomb dossier."

Catching the fever

Everyone's catching database fever, and the consequences can be severe.

Employers are running credit and criminal history checks of employees to assess trustworthiness. Landlords can now access a database to learn if a tenant has ever filed a complaint against a former landlord. Doctors can check to see if a patient

has brought a malpractice suit against another doctor.

Although these databases are notoriously inaccurate, they are used to make decisions affecting people at critical junctures in their lives. And in the near future, genetic testing will make it possible for insurance companies and employers to weed out people who seem likely to develop a physical or mental illness.

The good news is that consumers are catching on. They're learning that information about them is being bought, sold and exchanged by the private sector and the government, and they're beginning to insist on the opportunity to say "no" to secondary disclosures.

Recently, for example, the Social Security Administration was forced to stop matching and verifying millions of social security numbers for TRW, Inc. after the practice was made public.

Consumers are demanding privacy protection in the development of information products and services, and the industry is responding. Privacy is emerging as a critical factor that can determine the rise or fall of certain products.

The recent decision by Equifax and Lotus to abandon Lotus Marketplace was in direct response to intense and widespread opposition to the product, a database that would have contained names, addresses,

buying habits and income levels of 80 million households. Much of the information came from Equifax's consumer reporting databases. Outraged that such a vast amount of personal information was to be available without their permission, thousands of people insisted that their names be removed from Lotus Marketplace.



James Torok

In withdrawing the product, the companies conceded that the privacy problems could not be fixed. This session, Congress will consider a sweeping reform of the outdated law that regulates the credit reporting industry.

Digging deep

Caller ID is another product that taps people's deeply rooted sense of privacy and another area where public response has altered industry policy.

Early on, a number of telephone companies decided to market Caller ID to automatically display the number from which a call is placed, regardless of the privacy concerns of the

person making the call.

These telephone companies soon realized, after intense public pressure, that people want control on both ends of a telephone call — people on the receiving end want to see who's calling before they pick up the telephone, and callers want to decide when and to whom to give their number. Legislation is pending to require that, where Caller ID is offered, telephone companies must give callers the ability to block the display of their number on the receiving end. In the meantime, however, the public is demanding blocking and, with the exception of a few hold-outs, they are getting it.

Blocking actually serves the privacy interests of both callers and call recipients, who are often the same people. It actually provides more information for call recipients. For instance, people who are on the receiving end of abusive or harassing telephone calls may decide never to answer a call from a blocked number.

People who care about their privacy are a powerful constituency. In the past few years, a number of companies and trade associations have actively supported federal privacy legislation as a good way to assure the public that personal information is safe with them.

After the disclosure of ex-judge Robert Bork's video rental list, Erol's video stores, the Video Software Dealers Association and the Direct Marketing Association came forward to press for a tough law prohibiting video stores from releasing rental information without a person's

consent. The resulting Video Privacy Act of 1988 won the unanimous approval of Congress.

The Bork bill, as it is known, is not about having something to hide. It is about the freedom to view movies in the privacy of your own home, shielded from the prying eye.

Right to decide

The right to decide what people know about you strikes at the heart of our constitutional values of liberty, autonomy and freedom. Without the ability to retreat into our private world, we will lose our freedom to step boldly into public life. Privacy protection allows people to actively and openly participate in our society.

Unfortunately, in its recent decisions, the Supreme Court has lowered constitutional privacy protection to fit what is technically possible. For example, the court has ruled that since high-tech helicopters can hover over backyards, we should expect the Feds to be there. The court has also decided that, since cordless telephones operate on a radio-based, easy-to-overhear frequency, we should expect all of our conversations on them to be public. As a result, privacy advocates have learned that we must turn to Congress to write privacy expectations into the law.

Privacy advocates are not Luddites who are trying to smash the computer state. We are insisting that progress be measured by technology's ability to preserve privacy. In this area, progress must be defined by new technologies designed to meet — not undercut — society's legitimate expectations of privacy.

Goldman is director of the American Civil Liberties Union Project on Privacy and Technology.

Mainframe programmers and the V-8 mentality

MARC S. SOKOL



A recurring scene in the Danny DeVito/Richard Dreyfuss movie *Tin Men* says a lot about what's happening in information technology today. DeVito and Dreyfuss play two aluminum siding salesmen in the early 1960s. They drive around Baltimore in huge Cadillacs, but Dreyfuss starts noticing Volkswagen bugs zipping around all over the place.

By the end of the movie, he realizes that those peppy little cars represent the future and that the lumbering hulks he and

his colleagues drive are headed for near-extinction.

Today, something similar is going on in IS shops around the country. Not only have personal computers become more powerful, but a whole range of PC-based application development tools now exist — Cobol compilers, CICS emulators, debuggers, compression utilities, screen editors and programming shells.

Machine machismo

These products do more than enable PCs to build full-scale mainframe applications. In many ways, they do a better job of building those applications than mainframes do. Yet there remains a strong degree of resis-

tance to using PC workstations this way.

There are hard-core mainframe programmers determined to hold their ground against the incursion of smaller systems. They seem to feel that PCs just don't have "the necessities" — the capacity, the sophistication, the power — to perform mainframe programming and maintenance.

Much of this reflects the unique mainframe programmer mentality. It's well known that many of us who come from a mainframe programming background view ourselves as a kind of high-tech elite. We often distinguish ourselves by our language, style of dress and eccentric working hours. But most of all, some mainframe programmers pride themselves on the sheer size and power of the machines at their command. Within this group, the idea of programming on a PC is demeaning —

like asking Mario Andretti to drive a Ford Escort in the Indy 500.

The user has a choice today: Work the graveyard shift to get development time on the mainframe or work normal hours on the PC.

IS managers also have a choice: Let programmers hog mainframe resources to build applications at the expense of current operations and end users, or let them use separate, less costly and nondisruptive PCs to perform the same job.

Get the message?

The message for the mainframe programmer is clear: Adapt, or go the way of black-and-white television and monaural recordings.

Today's hard-core mainframe loyalists are like American carmakers in the 1960s. They too firmly believed that nothing would replace their hulking, su-

percharged monsters.

In a sense, the carmakers were right — there is nothing like the size and power of those big cars. There is also nothing like their gas guzzling, their jack-rabbit starts, their lack of maneuverability or their inability to get into small parking spaces.

Mainframes are already being used differently in the new IS environment, more as information repositories and large-scale batch processors. It is the less progressive, less realistic IS shops that will continue to buck the trend toward using PCs for these programming tasks. Such shops will pay a high price in the form of relatively low productivity, less effective applications and continued unresponsiveness to end-user needs.

Sokol is executive vice president at Re-alia, Inc., a Chicago-based producer of Cobol compilers and other application development tools for PCs.

Phar-Mor grows faster with DB2 MASTERMIND™

Phar-Mor, a deep-discount retailer with over 240 stores nationwide, opened more than one new store a week in 1990. This young, dynamic company has big plans, not only for retail growth, but for data processing.

Two DBAs are responsible for keeping current systems performing, installing an entirely new set of financial applications, installing a warehousing system, and beginning a conversion of their merchandising system from VSAM to DB2. To help them, Phar-Mor is using the three products that comprise BMC Software's administrative products, DB2 MASTERMIND.

Growing DB2 Usage

"DB2 CATALOG MANAGER is quickly developing DB2 literacy among programmers who haven't been exposed to DB2 and in some cases relational technology," said Mike Jones, DBA.

Growing DBA Productivity

"DB2 ALTER" allows me to accomplish tasks in three or four hours that would take a more experienced DBA two days to do manually.

"DB2 DASD MANAGER performs utility generation in a hundredth of the time I can write the jobs. It allows me to spend my time on tasks I've been educated to do: analysis, design and performance tuning.

"DB2 MASTERMIND makes it possible to manage the phenomenal growth we are undergoing," Jones concluded.

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SYSTEMS & SOFTWARE

COMMENTARY

Johanna Ambrosio

Users look at themselves

Attending a meeting of the User Alliance for Open Systems in Dallas last month was a little like being a fly on a therapist's wall. Users spoke among themselves about the real reasons why open systems are not yet widespread in IS shops, and they blamed themselves as much as the vendors.

You remember the User Alliance. They're the people who originally billed themselves as the Atlanta 6, then got to be the Houston 30. They started out as a bunch of users who just wanted to talk to other users about the issues and problems surrounding open systems. In January, they joined the Corporation for Open Systems (COS), which provides organizational support, but the User Alliance remains a group of volunteers. And, boy, are they still talking.

The 100-plus people who showed up in Dallas (official numbers were not disclosed, but estimates put about half of them as real users) lamented the fact that no truly "open" system — that is, vendor independent — exists yet. But equally as important, the users said, are politics and other internal goings-on at IS organizations.

Rick A. Barron, a business interface specialist at McDonnell Douglas Aerospace Information Services in St. Louis, perhaps summed it up best. "We are part of the problem. Even if we had all the open systems software and hardware, we couldn't implement them. We'd still not know how to sell management and deal with all our internal issues. We're saying we want one thing, and we are buying another. We're sending very mixed messages to the vendors."

Another participant was Carl L. Terrell, senior engineering associate at Tennessee Eastman in Kingsport, Tenn. "The technology is here. The biggest problem is the lack of acceptance in user organizations. It's not a technical issue; it's political. It's just as much the users' fault as the vendors'," he said.

Finally, David Judson, who's with the U.S. Air Force at Wright-Patterson Air Force Base, said, "Getting technology to work is the easy part. The

Continued on page 32

IBM satisfied with ES/9000 progress

Company positions product line for server role and moves away from traditional mainframe slot

BY ROSEMARY HAMILTON
CW STAFF

IBM said last week it is making big strides with its Enterprise System/9000, claiming it has met 70% of recent user group requirements with the products related to this new generation.

Nicholas Donofrio, an IBM vice president who took over as president of the Data Systems Division three months ago, based that number on requirements presented by both the Share and Guide user groups. "But that's not enough," Donofrio said. "We are a bit humble. While we are proud of our ES/9000, we have a long way to go."

Frank Gens, a vice president at Technology Investment Strategies Corp. in Framingham, Mass., said that while "IBM has done a good job, the user requirements are a moving target. That list grows daily."

Industry consultants and the press were given separate large systems briefings last week. Gens said IBM is continuing to position mainframes as corporate servers and is staying away

from large systems discussions revolving around "dollars per MIPS and transactions per second."

In the press briefing, Donofrio presented the ES/9000 as a server with several "enabling" technologies. This positioning was first made public by IBM last summer, when company executives provided a briefing on the changing role of the mainframe.

Sudden impact

Installations of new IBM 3090s fell off almost immediately after IBM announced the Enterprise System/9000 machines

Number of new U.S. installations		
	First half 1990	Second half 1990
3090	176	50
ES/9000	—	218

Source: Computer Intelligence
CW Chart: Doreen St. John

Donofrio said the ES/9000 could provide a number of server functions, such as enterprise data management, networking, sys-

tems management and security. He also suggested it would continue to play a hub role for such activities as applications development, transaction processing and technical computing.

Company officials also said delivery of Systemview, IBM's grand strategy for enterprise-wide systems management, is on track. As with its other major Systems Application Architecture initiatives, IBM insisted Systemview is "far more than a concept," although most Systemview-compliant products are not yet shipping.

The company restated plans to release documentation on the Systemview data model this year. IBM also intends to provide another guide with more information on how to conform to Systemview by year's end. The first performance guide was released recently.

Kathy Howell, director of systems management for the Enterprise System business line, said this data model documentation would be released "in a few months" and later clarified that time frame as "this year."

Howell suggested that Sys-

temview may get more of an AD/Cycle spin in that IBM will likely forge closer alliances with select third-party software companies to serve as key Systemview busi-

WE ARE A bit humble.
While we are proud of our ES/9000, we have a long way to go."

NICHOLAS DONOFRIO
IBM

ness partners. Since its introduction, AD/Cycle has had a key group of inner-circle business partners that have remained distinct from other vendors that have traditional marketing relationships with IBM.

On the hardware side, Donofrio said, the company has shipped 14 of the 18 ES/9000 processors announced in September 1990. Of the 90 software products announced then, nearly half have shipped, he added.

Publisher uses software to improve distribution

BY MARYFRAN JOHNSON
CW STAFF

INDIANAPOLIS — Addison-Wesley Publishing Co. was poised on "the eve of a great adventure" last week as it fired up new warehouse management software and launched a complete renovation of its national distribution center.

"We are involved in a broad-gauge overhaul of all our bread-and-butter systems, focusing first on the customer-oriented ones," said Bob Smallman, vice president of operations at the publishing firm. "Hopefully, what our customers will see is better service time from us."

Anchoring the change is The Warehouse Boss Version 2.0, an automated warehouse management system from Pansophic Systems, Inc. running on an Application System/400 Model B45 at Addison-Wesley's national distribution center here. A new order-processing system from Cambar Software will also be joining the renovation, run-

ning on an IBM 3090 mainframe at Addison-Wesley's corporate headquarters in Reading, Mass.

Orders will be processed on the mainframe and then downloaded to the AS/400, which manages the distribution process and passes data back to the mainframe.

Worth its weight

With sales in excess of \$300 million in 1990, Addison-Wesley specializes in college and school textbooks and a variety of trade books and publications. Its distribution center last year shipped more than 16 million units, 1 million mail and UPS packages and 25 million pounds of truck freight, Smallman said.

"We've enjoyed considerable growth. In the last four years, we've literally doubled in size," he noted. "With the new software and the new AS/400, we think we'll cut our in-house cycle time in half and improve productivity by 25%." Reducing errors in picking and shipping should be another windfall of the new sys-

tem, he added.

Last November, Addison-Wesley completed the addition of 137,000 sq ft to bring the size of its distribution center up to 400,000 sq ft. "We are totally changing our material handling systems, with all new conveyers and freight [sorting devices]," Smallman explained. "Boss is making the physical side of it all hang together."

New boss

The Warehouse Boss by Pansophic Systems, Inc. is going on-line this week at Addison-Wesley Publishing Co.'s distribution center



- Version 2.0 of The Warehouse Boss, an automated warehouse management system on the IBM Application System/400 platform, has been released.

- Enhancements in Version 2.0 include interfaces with a wide range of warehouse tools and equipment, such as bar coding systems, radio frequency terminals and other manufacturing business planning systems.

- Boss also interfaces with The Pansophic Resource Management System, an integrated business planning and operations system now offering Electronic Data Interchange capabilities.

- Addison-Wesley expects fewer errors in the picking and shipping process and especially likes the ability to integrate with other manufacturing packages, such as order processing software that resides on its corporate IBM mainframe in Reading, Mass.

- One notable lack: There is no module in Boss 2.0 for handling returns, so Addison turned to an outside vendor to custom design one. Pansophic claims over 50,000 installations at more than 15,000 mainframe and midrange sites.

CW Chart: Doreen St. John

How StorageTek is eliminating memory losses.

Do you wish you had selective amnesia every time you think about what your 3090 memory is costing you? Well remember this. StorageTek can install memory that works just like you-know-who's for a fraction of the price. In fact, depending on your storage needs, we can save you millions on central and expanded storage (Yes, we did say millions).

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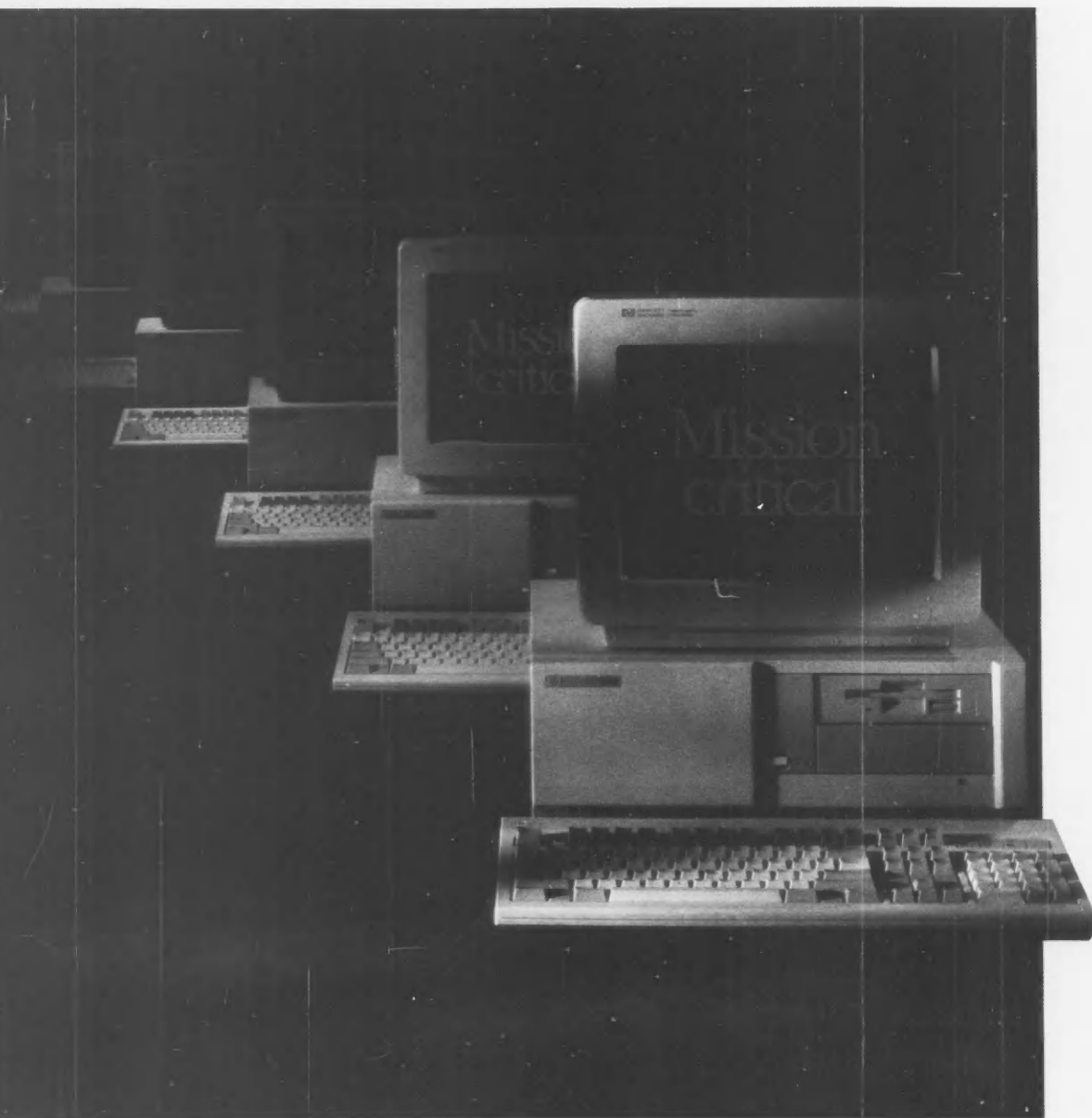
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Optical library in IBM plans

BY SALLY CUSACK
CW STAFF

IBM will soon announce an optical jukebox library storage subsystem, according to a report from Technology Investment Strategies Corp., a market research and consulting firm based in Framingham, Mass.

The write-once read-many optical library will be controlled by an IBM Personal System/2 and will support hundreds of gigabytes of data on 14-in. removable optical discs that will each store more than 6G bytes of data, the report said.

The most appealing aspect of the system will be its ability to operate on all IBM hardware platforms, said Robert J. Callery, a senior analyst at Technology Investment Strategies.

The system will be targeted toward personal computer local-area networks, Application System/400s and the S/370 and S/390 processor family. No VM or VSE support is expected.

"By putting an IBM logo on it and selling and supporting it on IBM platforms, it will automatically establish the product as credible in the user community," Callery said.

No competition

Noting that optical technology cannot compete with tape in the pricing arena, Callery pointed out that the next major challenge for general-purpose optical storage designers is to make it erasable for a reasonable cost.

While erasable optical discs do exist, current pricing prohibits most people from buying into the technology.

The cost issue is also expected to prevent the IBM optical library from cannibalizing IBM 3490 tape sales to any large degree, Callery said.

Three different optical jukebox systems are expected to be announced. The smallest unit will be slightly larger than a two-drawer file cabinet, while the larger will be about the size of an IBM 3390 disk drive. Access times are estimated to be in the 50-msec range with average disc changing times of under 10 seconds.

System models will be differentiated by number of optical discs and disc drives.

With first shipments scheduled for late this year, the new library is expected to appeal to specific archival-type applications, including blueprints, X rays, fingerprinting databases, maps, engineering drawings and manuals.

Automated garage set to deliver

No more aimlessly searching for cars in dark, crowded parking garages

ON SITE

BY SALLY CUSACK
CW STAFF

BARCELONA, Spain — Ever wandered aimlessly around a large garage, having forgotten where you parked your car? A project is under way here to build a parking garage capable of automatically delivering automobiles to their waiting owners in less than two minutes.

Camunsa Manutencion SA, an industrial-automation company based here, hopes to have the facility fully operational in time for the 1992 Summer Olympics. The project is the first of its kind in Europe.

Several computer technologies are incorporated in the project, including G2, a real-time expert software system from Gensym Corp. in Cambridge, Mass. Pyramid Integrator programmable logic controllers from Allen-Bradley Co. will operate the elevators.

DEC involvement

The software and controller system will run on two Digital Equipment Corp. Vaxstation 3100s.

On completion, the unstaffed,



Tom Monahan

10-story, underground garage will house 800 cars in the same amount of space that would accommodate 300 vehicles in a traditional parking area.

"Imagine a big warehouse with moving palettes," said Jordi Cruz, product manager at Allen-Bradley. "We needed a software with flexibility features in order to move the palettes. The expert system, G2, allows us to use knowledge rules to move each palette."

Six Pyramid Integrators — one to control each elevator — are connected to the DEC VAXs running the G2 program.

The software makes intelligent decisions about where the car should be stored and how it should be retrieved.

Parking in the garage will be 90% subscribed and 10% open to the general public, giving the G2 system the ability to learn about individual parking habits.

Customers will be issued a

ticket, or card, for their car. They will insert it into a card reader for interpretation and delivery. The software will also control fire and theft alarms within the structure, Cruz noted.

Cruz described G2 as easy to work with. Objects created within G2 will automatically refer to a value in the programmable logic controller.

The software allows developers to establish arbitrary relationships between objects in a knowledge base, and icon regions can be defined to allow an icon to be composed of different colors.

The Pyramid Integrators have the capacity to gather thousands of variables in less than a second, Cruz said, and G2 provides a bridge code to gather information from the controllers to insert into the knowledge base. The G2 bridge code is written in C language.

"Working with the expert system and the Pyramid Integrators allows for a rapid transfer of data," Cruz said.

Cost considerations

The total cost of the project is estimated at \$25 million, and the building planned above the garage will be "intelligent," too, with similar elevator control and G2 applications.

"The garage offers great economics," said Robert Moore, president of Gensym.

"In a typical parking facility, lots of space is given over to the physical maneuvering required to get in and out of the lots. This plan more than doubles the capacity of space used — a very valuable commodity in major cities," Moore added.

The G2 expert system has been available since 1988 and runs on DEC VAXs and Unix platforms as well as systems from IBM, Hewlett-Packard Co. and Sun Microsystems, Inc.

The system is compatible with X Window System, Transmission Control Protocol/Internet Protocol and Decnet networking environments.

IAAI winners reflective of mainstream trend

BY CAROL HILDEBRAND
CW STAFF

Like an art buyer who prefers a black velvet Elvis painting to an abstract expressionist work, artificial intelligence applications are veering away from the exotic and into the mainstream, a trend echoed by the choice of winners at this year's Innovative Applications in Artificial Intelligence (IAAI) Conference.

The conference, which will be held in conjunction with the American Association for Artificial Intelligence National Conference July 15 to 17 in Anaheim, Calif., showcases 21 applications.

IAAI tends to be more business-oriented than other AI conferences, according to Dave Blanchard, editor of Atlanta-based "Intelligent Systems Report," a newsletter covering AI and neural networks.

"It focuses more on business rather than academic applications," he said. "It's a good sampling of the types of things that are making companies big money."

Blanchard said he has seen AI

applications "absolutely going in a more mainstream direction." For example, he said, the first conference highlighted such projects as an application that could help a rescue team calculate the amount of people in the water in the event of a problem at an offshore oil rig. Now, "for every application like that, you probably have 10 where it's a big company that's getting an edge on their competitors by streamlining procedures or putting a lot of information on-line or coming up with an angle to save money."

Opening doors

With the commercialization of AI has come the transparency of the AI component to users.

"Those two trends are very, very relevant right now," said Neena Buck, director of AI research at New Science Associates, Inc. in Southport, Conn. "What's happened is that this technology and the tools that have come on the market have become very pragmatic and easy to use." That, she said, has allowed automation projects that were previously out of the question.

The applications being honored were judged on criteria such as significance, innovation and payoff.

Following is a sampling of IAAI winners:

- An expert system started at the State of California Health and Welfare Agency processes 400,000 travel expense reports annually and has significantly reduced audit time and errors in paperwork.

- Nynex Corp. reportedly saved \$6 million per year by using an expert system that diagnoses customer-related telephone problems.

- An AI-based maintenance scheduling system has increased fleet yield by 10% at American Airlines, Inc., which is using the system to juggle constantly changing flight schedules with such variables as weather conditions and federal regulations.

SOFT NOTES

Pick-Unix combo offered

Systems vendor General Automation, Inc. recently announced a hardware and software combination that allows users to concurrently run Unix applications and General Automation's R91 enhanced Pick environment. Prices for the new Advantix Operating Environment, which is available as an add-on for the company's Advantage Series systems, begin at \$29,995.

Hall-Mark Electronics Corp. has been authorized by Hewlett-Packard Co. to distribute HP 9000 series 800 multi-user computer systems to value-added resellers. This is the first time HP has agreed to sell its large multiuser, reduced instruction set computing-based systems through industrial distributors. Hall-Mark is a privately owned distributor of electronic components and computer systems products.

ZPS, a software vendor in the Soviet Union, has signed a cooperative agreement with SAP America, Inc. in Philadelphia, a subsidiary of SAP AG, a European software developer. Under the terms of the agreement, ZPS will market SAP's R/2 System within the Soviet Union. The R/2 System is for on-line, real-time mainframe business applications.

Ambrosio

CONTINUED FROM PAGE 27

tough part is working the infrastructure: changing how we do business, dealing with the culture chasm. We're affecting the organizational structure, and we're trying to figure out how to do that."

How are these users dealing with their companies' internal issues? Well, just like users anywhere, they get together to share what has worked for them and what hasn't. At the Dallas meeting — the User Alliance's first meeting to be open to the general public — the organization formed work groups to address such areas as education.

Sally Jenkins, leader of the task group on education and research, said one of her group's goals is to help users get away from brand loyalty (buying something because it's made by vendor X) to buying products based on the user's corporate standards. "Some of the companies in the Alliance are already there; some are not," she said.

Jenkins' group is collecting information about open systems pilot projects, names of knowledgeable people in the user community who are willing to speak about their open systems experiences, studies and standards groups that deal with open systems and business-case information about why open systems are advantageous from the user corporation's viewpoint (in other words, tools to help convince upper management).

Jenkins said some of this information will be available to Alliance members at the next general meeting, which is scheduled to be held in the fall somewhere on the West Coast.

In the meantime, discussion goes on among the users. They're continuing to talk about such things as the following: how much users should define open systems at the risk of stifling vendor creativity; the differences between interoperability and interchangeability and between a standard product and a standard interface; how the User Alliance should work with existing standards bodies; and how all this affects IS budgets.

The idea here is that the more parts that are interchangeable, the more expensive the systems will be — at least initially.

So, users recognize that they have to articulate what they want, prioritize their needs and determine how much they're willing to pay for all this openness.

These are important issues, and they affect or will soon affect every IS organization in the country. But so far, the User Alliance has just 22 members, and nine of these were already members of the COS. That makes a grand total of 13 new members, although perhaps an additional 50 user organizations are actively participating in the alliance's work groups, even though they are not formally members.

Still, that's not a lot when you consider there are more than 11,000 organizations in the U.S. with a mainframe installed.

So, what are you going to say when your kid (or maybe the kid who works for you) asks, "What did you do when the open systems movement was happening?"

Ambrosio is *Computerworld's* Mid-Atlantic senior correspondent.

Publisher

CONTINUED FROM PAGE 27

tory accuracy and better customer service are the aim of the enhancements made to Boss 2.0, company officials said.

"Slot level" inventory control was a key attraction for Addison-Wesley. "That allows us to get rid of our annual physical inventory," Smallman said, explaining that stock will now be inventoried more

frequently, keeping a kind of running tally on where everything is located.

"It gets rid of that operational disruption. Customers don't like to hear they won't get their shipment for three or four days while we count," he added.

The only missing piece in Boss was a module to handle returns, so the publishing firm had one custom-designed by another vendor. Aside from the hardware and software, however, the biggest challenge in such a far-reaching renovation is

managing the change from the users' perspective, Smallman said.

"I've had a number of calls from other IS departments that are thinking of installing Boss, and it occurs to me that if the push is coming from the IS part of the organization, that company may be in a lot of trouble," Smallman said. "This is a product that very much has to be user-driven from the distribution side because it's going to re-engineer the way you do business."

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Open systems vendor Sequent moves to Pick

BY J. A. SAVAGE
CW STAFF

Sequent Computer Systems, Inc., maker of multiprocessing computers based on the Unix operating system, said last week it is entering the Pick market.

By putting Pick business environment applications on top of Unix, Sequent

hopes to broaden its appeal in the commercial relational database arena. "Ninety percent of our systems are in the relational database market, and our sales guys were tripping over Pick deals right and left," said Al Dei Maggi, vice president of Pick operations at Sequent.

The Pick system, more than 20 years old, has remained a hit with its users, de-

spite the industry's move to open systems. By putting Pick on top of Unix, Sequent hopes to keep Pick's current users as well as add new ones.

"We want to be in the market because it's big, and no one owns it," Dei Maggi said. For instance, McDonnell Douglas Corp. and Ultimate Corp. are two of the largest Pick vendors.

Dei Maggi said he assumes one-third of the Pick market consists of die-hard Pick operating system users, but the rest probably will not care whether Pick applications run on the Pick operating system or on another operating system.

Pick applications will be available on Sequent's Symmetry 2000 computers. Symmetry, based on Intel Corp.'s 1486 processors, can be configured with up to 30 processors in one system. They range in price from \$190,000 to \$2.5 million.

Real-time EDI comes to CICS

WHITE PLAINS, N.Y. — IBM recently announced a data translation and document management program designed to allow customers with IBM CICS applications to send and receive electronic data interchange (EDI) transactions in real-time mode.

IBM Datainterchange/MVS-CICS is intended to support just-in-time systems and reportedly can be tailored to different application data formats, trading partners and networks through on-line customization.

The product can convert a customer's internal data formats to and from standards such as ANSI X12 and Edifact. According to IBM, allowing EDI transactions to flow interactively between an electronic mailbox and a CICS application without user intervention means customers and their business trading partners can exchange information in real time.

At the same time, IBM announced functional enhancements for the existing basic Datainterchange/MVS product, including a transaction store designed to separate translation and enveloping functions and thus provide flexibility and control over sending and receiving transactions. IBM also added on-line document management tools. Scheduled to be available in June, Datainterchange/MVS-CICS is priced at \$18,410 and up.

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NEW DEALS

Customs gives contract to CA

The U.S. Customs Service has awarded a five-year software services contract to **Computer Associates International, Inc.** in Garden City, N.Y. Under the contract, worth up to \$27 million, CA will help support the U.S. Customs data center in Newington, Va.

The Los Angeles County Office of Education has selected a **Bull HN Information Systems, Inc.** mainframe computer to expand and upgrade its administrative systems. The \$8.1 million DPS 9000 system will serve more than 100 school districts and other agencies and will process payroll and other administrative functions for the county's 130,000 teachers, administrators and staff members.

8 840 014 1A 6300

NEW PRODUCTS — SOFTWARE

Database management systems

Interactive Software Systems, Inc. has integrated its User Data Management System (UDMS), a user-oriented data management system designed for Digital Equipment Corp.'s VAX/VMS machines, with Ross Systems, Inc.'s business software.

Integration is accomplished via a predefined data dictionary. The amalgamated product features enhanced report writing capabilities across all Ross Systems business applications. It also provides links to other applications with diverse databases, such as Oracle Corp.'s Oracle and DEC's RDB.

Pricing for UDMS ranges from \$4,500 to \$54,000, depending on VAX CPU size. The Ross UDMS data dictionary is included with the product free of charge until June 1, 1991.

Interactive Software Systems
7175 W. Jefferson Ave.
Denver, Colo. 80235
(303) 987-1001

Development tools

Ask Computer Systems, Inc.'s Ingres Products Division has announced a terminal-based applications development tool designed to automatically generate high-level code that assists terminal users in developing business applications.

Ingres/Vision offers Frame Flow Diagram, a software component that lets users create applications visually by specifying frames to be used within an application, a process similar to making organizational charts. The product's Visual Query Editor allows users to define data to be accessed and operations to be made available within a certain frame, the vendor said.

The product is available for the Digital Equipment Corp. VAX/VMS environment. Pricing for a standard version equipped with a Microsoft Corp. Windows fourth-generation language, application code generator and other development tools ranges from \$1,500 to \$50,000.

Ask Computer Systems
2440 W. El Camino Real
Mountain View, Calif.
94039
(415) 969-4442

Objective Interface Systems, Inc. has announced a Unix version of Screen Machine for Ada, an Ada user interface development system that enables users to interactively create interfaces and use them from their Ada programs.

The product allows interfaces to be created with pull-down menus, action buttons and complex data entry forms. It includes

a copy of Panedit, an interactive software utility package that facilitates interface building, and package libraries for writing Ada applications behind user interfaces.

Pricing ranges from \$1,095 for an Intel Corp. 80386-based personal computer to \$4,300 for a large Sun Microsystems, Inc.

server. The product began shipping last month.

Objective Interface Systems
1875 Campus Commons
Drive
Reston, Va. 22091
(703) 264-1900

Applications packages

Software Engineering of Ameri-

ca, Inc. has announced an interactive job scheduling system that includes a TSO/ISPF interface with split-screen capability.

Computer Scheduling and Reporting (CSAR)/MVS Release 3.1 features job control language preprocessing that supports Restructured Extended Executor-style functions. Cross-memory services, flexible frequency standards and tape pull list reporting

are also provided.

CSAR/MVS runs on all levels of MVS, MVS/XA and MVS/ESA as well as on VM- and VSE-based machines.

Pricing ranges from \$12,500 to \$29,500.

Software Engineering of America
2001 Marcus Ave.
Lake Success, N.Y. 11042
(516) 328-7000

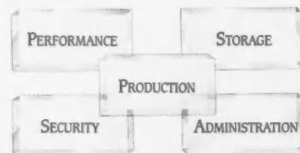
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Some of the benefits include: automated tracking of tape library inventory, early warning and recovery facilities, DASD performance measurement, chargeback, destruction protection and automated volume cleanup.

It's the most effective solution for managing both tape and DASD resources.

Erdas, Inc. has announced Erdas Revision 7.5, an integrated software package designed for such geographic information system applications as urban and regional planning, natural resource management, oil and mineral exploration.

Features include the ability to import data from raster- or vector-based statistical packages; the capability to convert Erdas

files to Adobe Systems, Inc. Postscript format for outputting to Postscript-compatible devices; and a Descriptor script language that enables users to write Descriptor macros.

The product is priced from \$2,500.

Erdas
2801 Buford Highway
Atlanta, Ga. 30329
(404) 248-9000

Computer-aided software engineering

System Software Associates, Inc. has announced that its IBM AD/Cycle line of computer-aided software engineering tools can now run on IBM Application System/400s.

AS/Set Version 2.0 includes

change management facilities, bidirectional referential integrity and templates designed to store screen and program functions as specifications.

The product is offered free to AS/Set clients who have maintenance contracts. First-time buyers may purchase it for \$15,000 to \$70,000, depending on AS/400 configuration and type of model.

System Software Associates
500 W. Madison
Chicago, Ill. 60606
(312) 641-2900

HARDWARE

I/O Devices

Sprinter, a series of stand-alone printer-sharing devices recently announced by Belkin Components, allows multiple serial port-based computers to share two parallel printers.

The series includes Model 6 x 2 (\$695), which has six serial input and two parallel output devices; Model 7 x 2 (\$849), which is equipped with six serial input, one parallel input and two parallel output devices; and Model 10 x 2 (\$995), which features 10 serial input devices and two parallel output devices.

All models feature a data buffer that queues computer outputs. The printers also can send documents to printers chosen by users from a pop-up menu.

Sprinter works with any Epson America, Inc. or Hewlett-Packard Co. Laserjet printers or compatibles equipped with standard parallel ports.

Belkin Components
14550 S. Main St.
Gardena, Calif. 90248
(213) 515-7585

Xpoint Corp. has announced a printer that features a maximum print speed of 15 page/min and 300 by 300 dot/in. resolution.

The XP 1500 can be attached to IBM System 36s, 38s or Application System/400s via twin-axial cable. It emulates an IBM 3812 Model 1 and 5219 and enables users to create applications ranging from simple memos to mortgage origination forms, store them in an on-line library and then print them.

The product (\$6,495) began shipping in February.

Xpoint
3100 Medlock Bridge Road
Norcross, Ga. 30071
(404) 446-2764

Power supplies

Exide Electronics Group, Inc. has introduced a pair of uninterruptible power supplies (UPS) that include input filters that yield a power factor correction rate of more than 0.95.

The 80ES and 150ES systems feature remote monitor emulation, which enables users to monitor a UPS from any location within their facility.

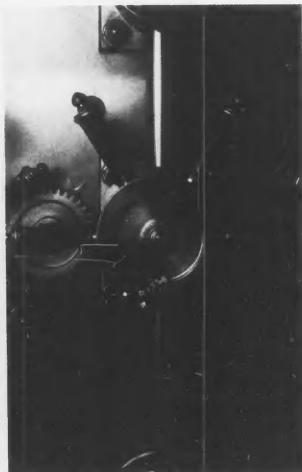
A 60-Hz version of the 80ES costs between \$34,650 and \$40,600. A 60-Hz version of the 150ES ranges from \$42,400 to \$57,400. The products began shipping this month.

Exide Electronics
5608 Spring Court
Raleigh, N.C. 27604
(919) 870-3239

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POWERstation 320H	\$17,972	11.7	32.4
SPARCstation 2	\$14,995	4.2	21.0
DECstation 5000	\$19,395	3.7	18.5

My How We're Growing.

And even more amazing, these babies just keep getting bigger. Now, we're introducing the new RISC System/6000 POWERstation 320H. It runs 11.7 MFLOPS* and 32.4 SPECmarks*. If you already have the original POWERstation 320, you can upgrade it now to the even more spectacular performance of the 320H.

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Our POWERserver 950 is also brand spanking new. It gives you the performance of the POWERserver 550—25.2 MFLOPS and a SPECmark of 56.3—but in a rack-mounted system, to share more disk storage, power and expandability with others. And all the models in the UNIX®-based RISC System/6000 family can now add disk expansion units for up to quadruple their previous maximum fixed disk storage. This yields up to 22.2GB on the POWERserver 950.



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Then there's the POWERgraphics GTO graphics subsystem. It can attach to any model in the RISC System/6000 family, to deliver super graphics performance previously available only in the POWERstation 730—990,000 3D vectors/second and 120,000

shaded polygons/second. That's more than enough to make your graphics look like a masterpiece.

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To find out more about the RISC System/6000 family, call 1 800 IBM-6676, ext. 878. And if you think this one-year-old is a handful now, just wait until the terrible twos.



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*SPECmark is a geometric mean of the ten SPECmark tests. MFLOPS are LINPACK double precision where n=100. AIX XL, FORTRAN Version 2.1 and AIX XL C Version 1.1 compilers were used for these tests. IBM and AIX are registered trademarks and RISC System/6000 is a trademark of International Business Machines Corporation. UNIX is a registered trademark of UNIX Systems Laboratories, Inc. SPECmark is a trademark of Standard Performance Evaluation Corporation. HAGAR THE HORRIBLE Character(s) ©1991 King Features Syndicate, Inc. ©1991 IBM Corp.

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PCs & WORKSTATIONS

COMMENTARY

Patricia Keefe

On the OS/2 warpath



Money talks. Another measure of IBM's seriousness when it comes to OS/2 is a report that the computing giant has increased its 1991 OS/2 research and development budget 32% over what it spent the previous year. On the flip side, there is said to be "some banter" among IBMers about cutting deals on OS/2 just low enough to cover costs. "It wouldn't be a bad idea," one consultant said. "Developers are out there saying, 'Show me the installed base,' while IBM is out there charging an exorbitant price for OS/2."

Can you handle this? OS/2 Version 2.0 isn't even out of beta testing, yet sources said work is well under way on OS/2 Version 2.1, which is described as "a major enhancement." Principally, the goal is to produce an object-oriented Presentation Manager, sources within the consulting community and IBM said. "Users will be able to manipulate the system through movement of icons," one source explained. In addition to better icon management, users can look forward to more three-dimensionality and better inter-

Continued on page 45

80286 laptops go obsolete — almost

ANALYSIS

BY MICHAEL FITZGERALD
CWI STAFF

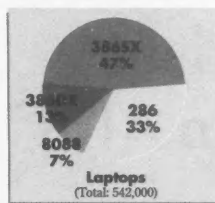
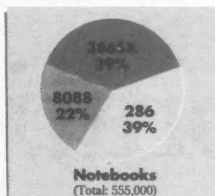
If you are the kind of person who stays up nights worrying that the Intel Corp. 80286 laptop you bought last year may now be obsolete, relax: It is.

Well, sort of obsolete.

Different worlds

A comparison of the CPUs shows more powerful 80386s dominating the portable market

Percent of U.S. market share by shipments (1991 projections)



Source: International Data Corp.

"It is, and it isn't," said Gib Hoxie, director of Booz, Allen & Hamilton, Inc.'s Information Industry Practice in San Francisco. "If you're going to run a character-based application and that's your only need for the thing,

then buy a 286. If people are thinking about [new portables], especially if they're going to [Microsoft Corp.'s] Windows, it's crazy to go with a 286."

Other analysts agreed that 286-based portables are by no means unusable or unsalable. Most also said they believed price will drive the 286 market.

"It'll be a price thing," said Bill Lablondie, an analyst at BIS Strategic Decisions in Norwell, Mass. "[The 286] is not a long-term market, but 386 systems are really coming onto stream this year."

A low supply of Intel 386SX-based systems may also slow the decline of the 286-based portable, analysts said.

"The SX is definitely overshadowing the 286, but a lot of the products available are 286-based," said Bruce Stephen, director of personal computer hardware research at International Data Corp. in Framingham, Mass. "For the price-conscious, you've got notebook systems now for under \$2,000, and it's reasonable to assume by the end of year it'll be \$1,500."

Users confirmed analysts' projections. The Timken Co. in Canton, Ohio, plans to take advantage of the increased power available from 386SX-based portables, specifically with Windows 3.0, said Gene Wheeler, office technology programmer.

However, at Hyundai Motor America, whose sales, parts and service representatives carry Compaq Computer Corp. LTE/286s, more advanced technology is not of interest. Carrie M. Ulvestad, national manager of dealer communications at

Hyundai, said 386-based machines figure in the plans for the desktop but not for laptops.

"For what they're doing — very basic Lotus [Development Corp. 1-2-3] work, file transfer and E-mail — they wouldn't see any benefit from [386-based machines]," Ulvestad said.

Users with 286-based portables who are moving to 386SX-based notebooks are not dumping their investments in the older machines, by and large. At

Coors Brewing Co. and Blue Cross/Blue Shield of Massachusetts, for instance, most portables are 286s, but they are being phased out in favor of more powerful machines on an as-needed basis.

Caisse Nationale de Credit Agricole U.S.A., the U.S. branch of the French international bank, will follow a similar strategy, according to Paul Nelis, microcomputer specialist at the bank, which currently uses Compaq LTE/286s but will buy SX-based notebooks in the future.

Turner rebuilds on PCs

ON SITE

BY RICHARD PASTORE
CWI STAFF

NEW YORK — Construction firm Turner Corp. traces its downsizing decision to the success of one personal computer software package. The financial software was first implemented five years ago when Turner had only 50 PCs company-wide. Today, the firm has close to 2,000 PCs; its IBM Series 1 mini-computers are history, and its IBM 4341 host will join them by year's end.

Turner, a \$3.25 billion construction firm with 3,000 professional staff members, was having trouble collecting and consolidating general ledger data from its 28 distributed offices in a timely, accurate

manner. It took three weeks to pull the monthly task together with a mainframe package and transmit it from the remote Series 1s to the 4341 at headquarters here.

Often, Anthony Breu, vice president and chief financial officer,



Turner's Breu cut IS budget using PCs

cer, could not wait out the lag time. "I had to call up and ask
Continued on page 41

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Database aids identification process

ON SITE

BY JIM NASH
CW STAFF

Crime suspects in Northern California who in the past might have stood with loathing in a police lineup have something else to dread: the desktop workstation. The personal computer is trying to nab them.

Meanwhile, applicants for welfare in Southern California will be dealing with PCs, too. The two groups will be among the first people in the nation to find their individual identities stored on desktop computers. The computers will scan their fingerprints, match them against a database of prints and, in most cases, confirm their identity.

Mainframe storage of fingerprints tied to civil and criminal records is commonplace in many major U.S. cities, but similar systems designed for the more flexible and affordable

desktop are virtually nonexistent. That may change in the near future.

Deep in Silicon Valley, Wally Briefs, crime analysis coordinator at the Sunnyvale Police Department, is testing a software-based system that combines Hewlett-Packard Co.'s newest workstations with Cogent Systems, Inc.'s applications and fin-

gerprint-scanning hardware. Together, they "blow the doors off" existing hardware-based systems, which require mini-computer or mainframe platforms, Briefs said.

Curtis Williams is a project director at Electronic Data Systems Corp., the winner of a five-year, \$9.6 million Los Angeles County contract to build and maintain a desktop fingerprint-identification system. EDS will use the same HP/Cogent combination this summer to identify citizens applying for benefits from the county's Department of Public Social Services in Norwalk, Calif.

Both projects are based on Cogent's Live-ID software, which is written in C language and runs on HP 9000 series workstations. Briefs and Williams said that Live-ID is unique in that it runs on workstations and that it is software-driven.

"If you give [the workstation] more processing power, Live-ID

takes advantage of it," Briefs explained. The hardware-driven systems available today, such as those produced by NEC Corp., Briefs said, are proprietary and must be upgraded with each new hardware iteration.

A spokesman for Cogent said the number of prints the company's software can hold is limited only by the number of hard drives clients use. The company, based in Alhambra, Calif., initially developed the application for Sun Microsystems, Inc. workstations but ported it to HP for Sunnyvale because the department has standardized on its machines.

Right now, the department has dedicated an HP 9000 Model 400S running at 12.5 million instructions per second to the task of absorbing eight fingerprints from each of 20,000 people. Briefs said he uses an Identix, Inc. print scanner. A spokesman for Cogent said the Live-ID software used in Sunnyvale costs \$250,000. It captures prints, extracts unique features, compresses each image in order to maximize memory and compares new prints with those in the database.

When the system is fully operational, Sunnyvale will use it to check each booked suspect's prints immediately.

Portable gear

With hardly a pause, Cogent Systems is moving Live-ID, its fingerprint-matching software, from the desktop to the portable computer. The Immigration and Naturalization Service (INS) has purchased a version of Live-ID for use on Sony Corp.'s News portable.

This is only a pilot project with no commitment to outfit the entire service with portable identifiers, said Tim Biggs, chief of the INS' identification section in Washington, D.C.

He explained that the INS will store 65,000 individual prints on the system. If it works well, Biggs said, and the News machines can be ruggedized, the INS would like to install them in vehicles and pack them on mounted patrols.

JIM NASH



Desktop computers can help confirm identities with the storage of individual fingerprints

OS/2 popular choice over Windows, SAS exec says

BY SALLY CUSACK
CW STAFF

The debate between Microsoft Corp. Windows and IBM OS/2 factions may be a bit like grade-schoolers playing Red Rover, Red Rover: Each side wonders if members of the other side will "come over" to stay.

While there will probably never

be a clear winner, a significant block of personal computer users have recently lined up behind the OS/2 environment.

"We think we have ample evidence to suggest that OS/2 is alive and well in corporate America," said Randy Betancourt, workstation marketing manager at SAS Institute, Inc., a software firm based in Cary, N.C.

SAS has invoiced \$3 million in first-year fees since it started shipping the SAS System for OS/2 last November, Betancourt said. The SAS Application System is a modular suite of software products that runs on most vendor platforms, including those of IBM, Digital Equipment Corp., Hewlett-Packard Co. and Data General Corp.

Of 600 site licenses, between 240 and 250 were issued in the U.S., with the remaining 350 in Europe and Asia. Fifty percent of all licenses are IBM mainframe sites, Betancourt said, adding

that of those sites, most run OS/2 on a local-area network-based connection to the host computer.

A satisfied user

Frank Mantha, information center supervisor at Niagara Mohawk Power Corp. in Syracuse, N.Y., first saw the SAS for OS/2 product when his company beta-tested it six months ago.

The company has an IBM 3090-400J but is putting SAS for OS/2 on LAN environments via IBM Personal System/2 Model 95 servers. Mantha anticipates

125 users per server when all is said and done.

"We considered Windows, but I have 3,500 machines to link up over the next several years. Windows as it is today is just too difficult to manage in a network environment," Mantha said, adding that he hopes to see Windows running under OS/2.

Niagara Mohawk currently has 600 SAS System users on the mainframe. Mantha said 88% of the jobs running through the host computer are end-user jobs, and approximately 50% of those are accessing SAS.

Now, an SPF editor for OS/2

With SPF/2 on OS/2, you can do program development and maintenance on the PC just the way you do on the mainframe with ISPF/PDF. SPF/2 offers the same familiar environment, command structure and editing capabilities. You already know how to use it; no training required.

SPF/2 takes advantage of OS/2's powerful features. It uses virtual memory to handle very large files. HPFS (High Performance File System) long file names are supported. And SPF/2 uses OS/2's REXX for its macro language—75 mainframe-compatible ISREDIT edit sub-commands provide the interface.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 even displays the same status indicators.

Editing a COBOL file with SPF/2



You will also enjoy features not available on the mainframe. For example, SPF/2 supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or windowed), and scrolls the file as you

move the cursor. And, you will appreciate OS/2's virtually instantaneous response time.

If you have a departmental or company-wide need for SPF/2, a special cost-effective Multi-User License is available directly from CTC. For information and pricing, call our Sales department at (800) 336-3320.

Try SPF/2 for yourself with a free real-working-code demo disk—just like the production version, except it doesn't save your editing changes to disk. Call the toll-free, Demo Request Hot Line at (800) 648-6700 and ask for SPF/2 Demo Disk #168.



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Foxpro: Packs power, lacks built-in query

Fox Software, Inc.'s Foxpro Version 1.02

Reviews	Ease of use	Data integrity	Multuser support	Performance	Application development	Documentation	Service & support	Value	Score
Infoworld 11/12/90	Very good	Poor	Good	Very good	Very good	Good	Poor	Very good	6.2*
LAN Times 11/19/90	Excellent	Good	Good	Excellent	Complete	Excellent	Satisfactory	NC	Recommended for network
PC Week 10/11/90	9	NC	NC	NC	9	7	NC	NC	7.8*
Users									
Robert Davies, SBT Corp.	■	■	■	■	■	■	■	■	Fast and reliable
Y. Alan Griver, Flash Creative Management, Inc.	■	■	■	■	■	■	■	■	Top-notch tool
George Goley, Micro Endeavors, Inc.	■	■	■	■	■	■	■	■	Best performance
Analysts									
Dean Hiller, D. L. Hiller & Associates	■	■	■	■	■	■	■	■	Good
Jerry Caron, Faulkner Microcomputer Reports	■	■	■	■	■	■	■	■	Good
Adam Green, Adam Green Seminars, Inc.	■	■	■	■	■	■	■	■	Good

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.

*Infoworld and PC Week ratings are based on 1 to 10 ratings where 10 is best NC: No comment

Key: ■ Very good ■ Good ■ Fair ■ Poor

Technology Analysis — a roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weisel.

Foxpro Version 1.02 from Fox Software, Inc. brings the pull-down menus, mouse support and windowing of the Apple Computer, Inc. Macintosh to DOS database management systems users. While reviewers said that Foxpro's integrated approach makes it easy to use, they criticized the package's data integrity features and lack of a built-in query engine.

Ease of use: Reviewers credited Foxpro Version 1.02's mouse-based interface, pull-down menus and windows with making a powerful, sophisticated program intuitive and easy to use. With a mouse, they said, tasks such as report design have never been simpler. Keyboard operation is possible, although learning the key combinations may take some time. Most, but not all, commands can be executed from pull-down menus.

However, some components of the program can be confusing, reviewers said. Without a built-in query engine, users must rely on browse windows and filter expressions to perform file queries. Other modules, such as the screen generator and the editor, are command-driven and inconsistent with the rest of the program.

Data integrity: With Foxpro 1.02, users must assume much of the responsibility for data integrity. For instance, according to *Infoworld*, Foxpro's file- and record-locking features are useful and reliable but not automatic, except during interactive use.

Also, according to *PC Week*, data entry validation checks are available but must be programmed at the command line, which can be difficult and time-consuming. Foxpro also lacks support for transaction logging and rollback as well as field-level security in a multiuser environment.

Multuser support: Foxpro does well in a multiuser environment, with

Vendor financial information

Foxpro is currently third in total market share among personal computer-based database management system software packages, according to the company. Fox Software, Inc. is privately held and does not release financial information. According to President and Chief Executive Officer David L. Fulton, the company has no long-term or short-term debt and is profitable. Fox employs 200 people worldwide.

users experiencing little performance degradation, according to *Infoworld*. In addition, each user on a network can have a customized Foxpro environment, including colors, menus and macros.

The trade-off is that network set-up time may be longer than for conventional systems. Data integrity is the only significant multiuser drawback.

Performance: For raw speed, Foxpro is unmatched in the personal com-

puter database management arena, reviewers said. The system, which requires a minimum of 512K bytes of memory, can take advantage of both expanded memory and a math coprocessor. Because it uses a runtime interpreter to execute programs, Foxpro provides faster programming than conventional databases.

Application development: Behind its flashy interface, Foxpro 1.02 includes a form and screen generator, editor, macro language and compiler as well as a documentation generator and template language. According to reviewers, these tools and an excellent source-level debugger give developers everything they need. There is limited mixed-language programming, however, and *PC Week* said it found some functions not as well integrated as might be desired.

Documentation: Foxpro's documentation is extensive. An index, reference manual and separate book for network use are included. On-line Help, however, is not context-sensitive and is geared primarily to developers.

Service and support: Telephone support is free, although not toll-free, and there is a 30-day money-back guarantee.

Value: Foxpro 1.02 costs \$795. The local-area network version, which supports an unlimited number of users, costs \$1,095. The runtime module, which costs \$500, allows distribution of unlimited application programs.

According to reviewers, with Foxpro 1.02 you get a fun, easy-to-use database system that is powerful enough to tackle complex, multiuser database projects.



"FOXPRO IS A GREAT development environment, with excellent debugging and interface capabilities. Applications can be mouse-driven with multiple windows, and you don't need Windows to do it."

George Goley
Senior Partner
Micro Endeavors, Inc.

Fox responds

Comments from David L. Fulton, president/CEO:

Ease of use: In the next release of Foxpro — Version 2.0, due out next month — we will completely integrate all functions, such as screen generation. The new version will include a query-by-example module that provides a nonprocedural interface for defining queries and links to SQL.

Data integrity: Features such as transaction logging and rollback will be more efficient in Version 2.0, but they will not be automatic until we release a server product.

Performance: We try to use available memory to boost performance as much as possible.

Documentation: In Version 2.0, on-line Help will be completely context-sensitive, down to the dialog level.

Service and support: We know we cannot provide immediate turnaround on technical support, but if we can get back to everyone within 24 hours, we are happy.

Value: We have tried in Version 2.0 to address all of the shortcomings of Version 1.02. The price will be the same.

NEXT WEEK

► Reviewers find Microrim, Inc.'s R:Base Version 3.1 a smoother performer than Version 3.0, but the product still lacks speed.

Turner

FROM PAGE 37

them "what's the bottom line?" he said. If the data had not yet been consolidated and checked, it was likely to be inaccurate, Breu added.

To solve these problems, Turner tried IRMS, Inc.'s Micro Control financial reporting and consolidation package.

The package cut consolidation time to 15 minutes and monthly report lag to five days. With the PC network, Breu can now review any portion of the data the following month.

Couldn't get enough

Not only the results but also the implementation process left Turner hungering for more PC applications. The firm got Micro Control up and running in six weeks, and "the beauty of it was we didn't use any MIS people," Breu said. From that initial success, "we established a policy companywide to migrate completely to PCs," he added.

In the last two years, all but a pair of linked applications have been migrated down from the 4341. And Turner has already found two store-bought packages to take those applications to the PC by the end of the year, Breu said.

The benefits have been cost savings and improved efficiency. "There used to be a lot of downtime," Breu said. Because the remote-site Banyan Systems, Inc. networks run independently on their Compaq Computer Corp. servers, the entire company does not come to a halt when one network shuts down.

Over the same period, the information systems staff, which Breu formerly headed, has been cut in half to 25 people. The IS budget has also been halved at a savings of millions of dollars. To help with support, Turner contracts with an outside vendor for remote-site maintenance.

The small staff is possible because the firm chooses to follow a buy-rather-than-build software philosophy, Breu said. However, that strategy has perpetuated the company's biggest downsizing hurdle — finding suitable packages.

Turner's problem is finding PC-based applications capable of handling business transactions as large as the \$50,000 to \$200 million contracts the firm lands. The typical \$495 shrink-wrapped product cannot accommodate that. Turner has to look toward less mass-market products such as the \$95,000 IRMS Micro Control.

Turner also has a policy of minimizing change in operational procedures. That means persuading vendors to tweak packages to accommodate Turner's way of doing things. "Nine times out of 10, [the vendor] makes changes for us," Breu said.

Digital F/X updates video editing features

MOUNTAIN VIEW, Calif. — Digital F/X, Inc. has announced major software enhancements to Video F/X, a desktop video production system designed for in-house and broadcast-quality presentations.

Video F/X Release 2.0 is an Apple Computer, Inc. Macin-

tosh-based system that harnesses live video, audio and graphics into a final broadcast tape. The new release eases the editing and transition processes, President Rolando Estevearena said.

The central additions to Release 2.0 are the inclusion of nonlinear editing, which allows

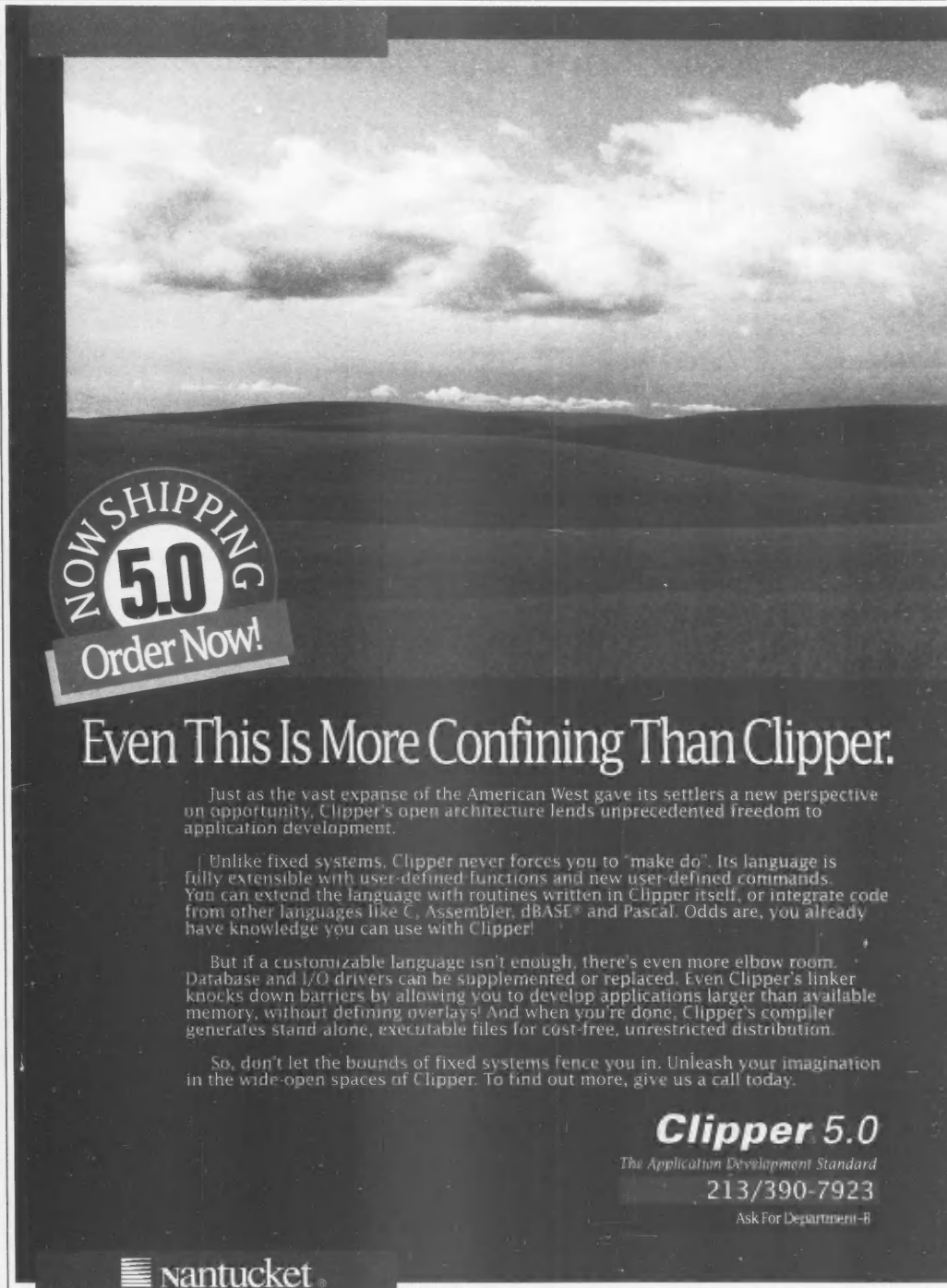
users to digitize video onto a hard disk where it can then be edited in real time, and A/B roll, a production feature that allows smooth dissolves from one full-motion video scene to another.

In addition, the update provides PICS animation support, which lets users record anima-

tion onto videotape. Video F/X also offers enhanced Adobe Systems, Inc. Postscript for video, letting Macintosh users overlay any Macintosh graphic or title onto the video.

Release 2.0's nonlinear editing feature is included in the product's \$9,995 price. A/B roll and PICS animation support will be offered as options.

JAMES DALY



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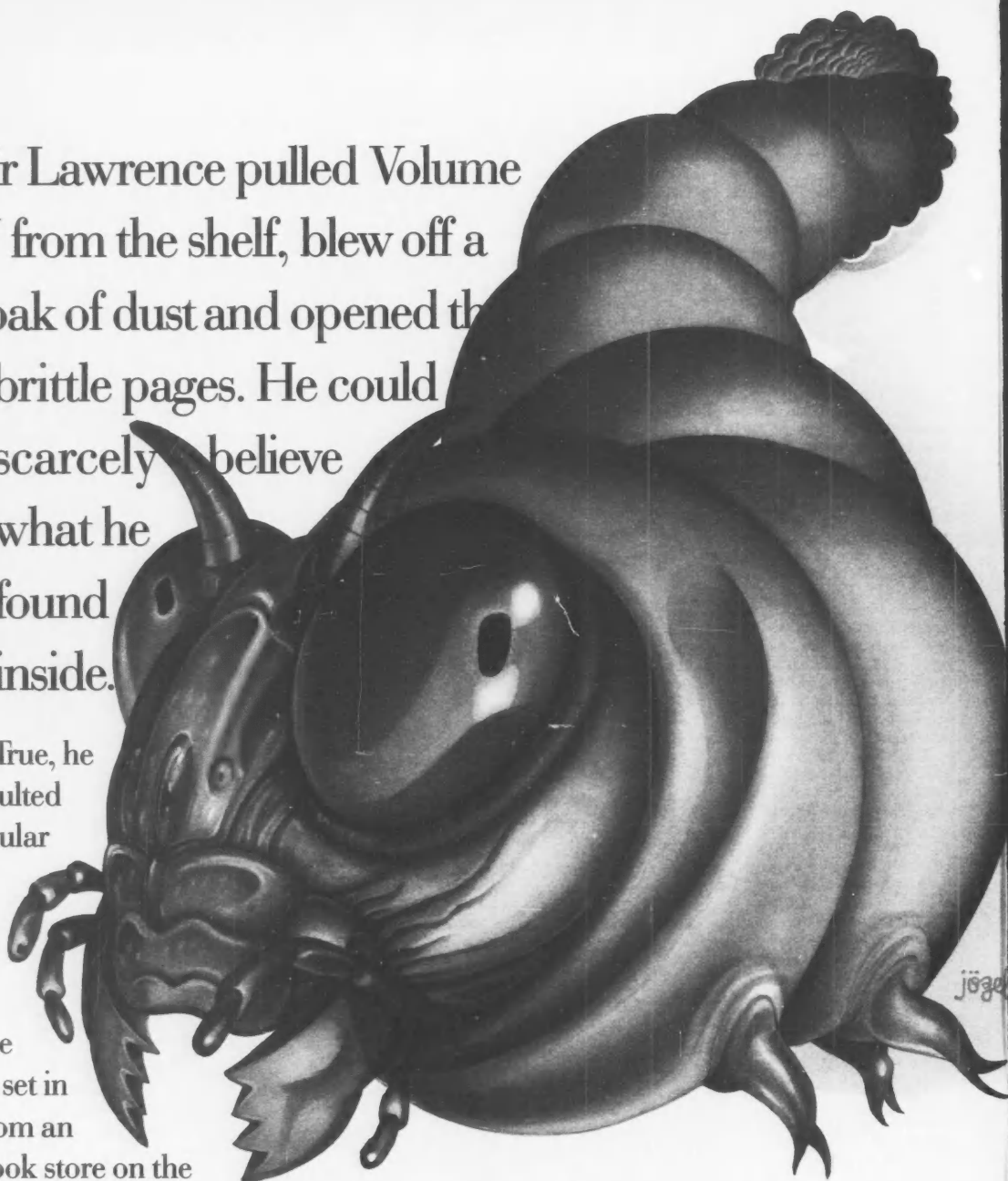
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Sir Lawrence pulled Volume IV from the shelf, blew off a cloak of dust and opened the brittle pages. He could scarcely believe what he found inside.

True, he hadn't consulted these particular journals in years and, admittedly, he had acquired the ten-volume set in his youth from an odd little book store on the

Thames, but still! Holes!? A bookworm had eaten clean through the pages. Indeed, to Sir Lawrence's considerable chagrin, he found the ravenous little bugger had chewed, in a straight line, from the front cover of Volume I to the back cover of Volume X.

All of which brings us to our seemingly simple question: If each book is exactly two inches thick, how far did the bookworm travel?



In tussling with this type of cerebral aerobics, most people make a simple but serious error: They *assume* something. Of course, this happens without realizing it. But still, it happens.

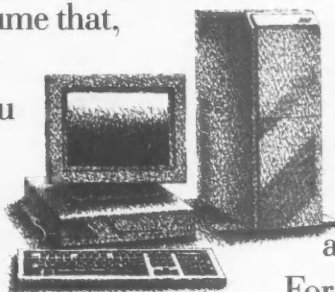
As you'll see in a moment, the way to avoid making a false assumption is to work things out methodically. Carefully thinking through each step.

For instance, consider this question. A company makes one of the broadest lines of computer terminals in the world. They have for years. In fact, they've delivered over three million of them.

If you needed terminals you'd probably think of them. But what if you needed PCs? Would you assume that, since this company is so dominant in terminals, they must

Tsk, tsk. Have you

Well, as you may company in question is Wyse. we don't have an impressive PCs it would be a shame.



learned nothing?

have *correctly* assumed, the And if you've been assuming array of powerful, priced-right For both of us.

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The Decision Series PCs: 386sx/16s (shown), 386sx/20, 486/25, 486/33e (shown). Advanced ergonomics, finicky attention to detail, exceptional power for the dollar.

new Decision Series. Four set of features. Generous

power supplies, three styles of ergonomically advanced chassis, multiple configurations, popular Wyse-designed keyboards, aggressive pricing and bundled DOS 4.01.

For starters.

Of course we realize there's a good chance some of you may have read this far because you're more interested in the answer to our puzzle than in our products. You've *assumed* we'd bury the answer down here somewhere. Well, you're wrong again. At least partially. So go look on page 84.

Now that it's clear we make an impressive line of PCs, you might be tempted to assume we stop there and don't get into the even more sophisticated products like super fast multi-processing systems for the UNIX environment. With speed in the 100 MIPS range.

But you wouldn't assume that after all this. Would you?

To learn more about our Decision Series PCs call us. We'll send you complete specs plus a poster of additional Cerebral Aerobics. To help keep your original equipment personal computer in top form. 1-800-GET WYSE.

WYSE

You're doing it again. Just because this little type is down here and printed upside down you assumed you'd find the answer this easily. No way. San Jose. Refer back up to the ad and your patience will be rewarded.

Roadshow puts deliveries on track

BY GARY H. ANTHERS
CW STAFF

Bank of America, Nynex Corp., *The New York Times* and Marriott Corp. would seem to have little in common, but they share at least one key characteristic: They own fleets of vehicles that move daily over complex routes making pickups and deliveries.

They all have something else in common: They have licensed Roadshow, a personal computer-based software and hardware package for optimizing routes and schedules. The only product of Vienna, Va.-based Routing Technology Software, Inc., Roadshow combines least-cost routing optimization with high-quality video map displays.

Bank of America uses Roadshow to help plan pickups and deliveries of checks and interoffice mail among some 850 bank branches and data processing centers — and an unspecified number of customer sites — in California. The bank's 500 cars and vans cover between 2,000 and 3,000 routes per day in ever-changing patterns and schedules that would be nearly impossible to optimize manually.

According to bank Vice Presi-

dent Hank Thomas, Roadshow replaced a manual system in which proposed routes had to be test-driven. Now, Roadshow determines the feasibility and cost of new routes in minutes and with great reliability, he said.

Thomas said Roadshow's precise routes and timing offer another advantage: "It's taken the slack out of the system. No more stops for McDonald's."

Reality check

According to Routing Technology Software's Chief Executive Officer Donald J. Soult, Roadshow is the only automated routing tool to use full-color video images of commercial maps rather than stick-figure maps painted on a computer screen. At the click of a mouse, Roadshow can zoom to successive levels of detail, from a view of the interstate highway system to block-level detail in a specified city. Routes and stops are displayed on the maps in bright colors, while delivery schedules, mileage, costs and other tabular data are displayed on an adjacent computer screen.

Routing Technology Software recently added a database that maps nearly all street ad-

resses in the U.S. to geographic coordinates with an accuracy of 3 meters. A user can enter an address and see the location precisely pinpointed on the video map.

Unlike other routing packages that find the least mileage route and then compute the cost of traveling that route, Roadshow finds the least cost route. That avoids mistakes such as routing trucks through downtown during rush hour when taking a bypass around the city makes more sense. Roadshow considers vehicle costs per mile, vehicle costs per hour and driver and crew costs per hour. It then considers distance, travel time and on-site delivery time in computing the total cost of a route.

Roadshow also considers a myriad of real-world factors and constraints, such as time-of-day influences on traffic patterns and speeds, temporary construction delays, customer-specified delivery times and time required at each stop.

Illinois Armored Car Corp. runs 60 routes per day in the Chicago area, each with 50 to 60 stops. Roadshow is used by both operations and sales personnel to analyze potential route changes, company President Alex Christopher said. For ex-

amples, a customer might call and ask if his delivery schedule can be moved to another time of day. Roadshow can check the feasibility of doing that and compute any extra cost.

Christopher said one company was willing to pay a 33% premium over one of his competitors to get the reliable delivery

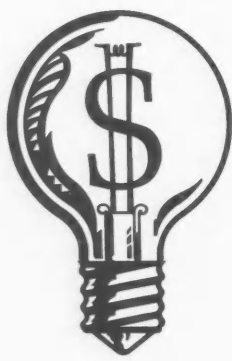
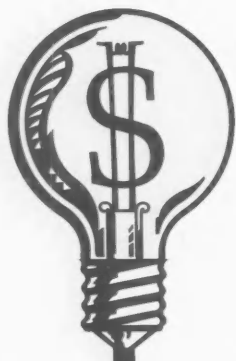
times that Roadshow helps ensure. "There's no question it has improved customer service. I was considered crazy to spend so much [\$75,000] for Roadshow. Everyone said the computer couldn't do it," he said.

Roadshow runs on PCs assembled by Routing Technology Software. The minimum configuration has an Intel Corp. 80386 processor and 8M bytes of memory. The large memory allows Roadshow to do its number-crunching optimizations with no disk I/O. Hardware packages, which include a 100M-byte hard disk drive, color monitor, 60M-byte tape backup unit, a laser videodisc unit and other pieces, cost between \$9,630 and \$12,190. Software is priced at \$50,000 and up, depending on features.

Soult said the software underlying Roadshow has taken 20 years to develop, but it is paying off in spades: Last year, Routing Technology Software was ranked No. 319 on *Inc.* magazine's list of the 500 fastest growing private companies in the U.S.



Roadshow displays routes and stops on its map in bright colors



Keefe

FROM PAGE 37

face layout. We're told a fourth-quarter release is possible.

Speak softly and carry a big stick. New Technology OS/2 Version 3.0 has been designated as the portable OS/2 platform. However, there have also been reports of IBM porting OS/2 Version 2.0 to other platforms, but sources contacted last week said the effort is currently confined to a "laboratory experiment" and will probably see the light of day only in the event that Microsoft and IBM diverge on product vision for New Technology OS/2 3.0. IBM Vice President Joe Guglielmi has said IBM will withdraw from OS/2 Version 3.0 development if that happens [CW, April 1].

Taking a page from Novell. A user source tells us to look for segmentation of OS/2 LAN Server, much as Novell packages Netware. Users will have a choice of Basic, Advanced and Super LAN Server, we're told. The Advanced and Super models are supposed to be add-ons to the Basic and will be made up of many of the "Superserver"-re-

lated products IBM has been showing at trade shows.

These products include a high-performance file system, a device driver for the Bus Master Token Ring, mirroring, duplexing, "pigtail" disk arrays and, of course, the two-processor LAN Server. This user, however, notes that he

O S/2 VERSION 2.0 isn't even out of beta testing, yet sources say work is well under way on OS/2 Version 2.1.

much prefers IBM's pricing of LAN Servers to either Novell's or Microsoft's.

Thank you for your support. We've noticed a tiny trend among some disillusioned Windows users: Some, mostly power users, have switched to Quarterdeck Office Systems' character-based Desqview.

A cost accountant at an electronics component maker said he found Windows harder to get up to speed on and somewhat slower than Desqview. "Win-

dows is harder to understand how to manipulate," he said. "Desqview is simpler. You just load it in, and the menu is right there." The accountant also found it easier to switch among programs under Desqview.

That's because Desqview is a true multitasking system and has better memory management, says a field service engineer at the same firm. He says power users of processor-intensive applications, such as spreadsheets, may prefer Desqview because of its ability to simultaneously run multiple programs. But when automating an office, the engineer says, Windows is still the best choice. "Because it is graphically oriented, all you need is one person who can set applications, so the users can just click on an icon and get into them."

Still no takers. Lotus Development Corp. is still scouring the continent for a buyer for its CD-ROM division, says a source who cites a recent rumor that Lotus was talking a few months ago to a Canadian firm about buying the division. However, Lotus must have gotten the CD-ROM division mixed up with the Red Sox. Its asking price was said to be out of the ballpark; hence, no sale.

Unisys steps up to the 80386SX starting line

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Joining the crowd offering Intel Corp. 80386SX-based computers, Unisys Corp. unwrapped a diskless 80386SX-based local-area network workstation and an introductory 386SX personal computer two weeks ago.

The PW² LAN Workstation/386SX follows on the heels of an 80286-based version introduced by Unisys in May 1990.

Exclusively designed for networked applications, the PW²'s electronics module includes 10M bit/sec. conventional, thin-wire and twisted-pair Ethernet LAN adapters. Token Ring and Omnet interfaces are available as options.

The 16-MHz CPU comes with 2M bytes of memory expandable to 8M bytes and a network boot in read-only memory. Unisys is also offering an optional 80387SX math coprocessor.

The monochrome system, which includes an IBM Personal System/2-style mouse port with

mouse and Microsoft Corp.'s MS-DOS and Windows 3.0, sells for \$2,710. A 14-in. Video Graphics Array (VGA) color monitor system costs \$3,070.

Snappy personality pack

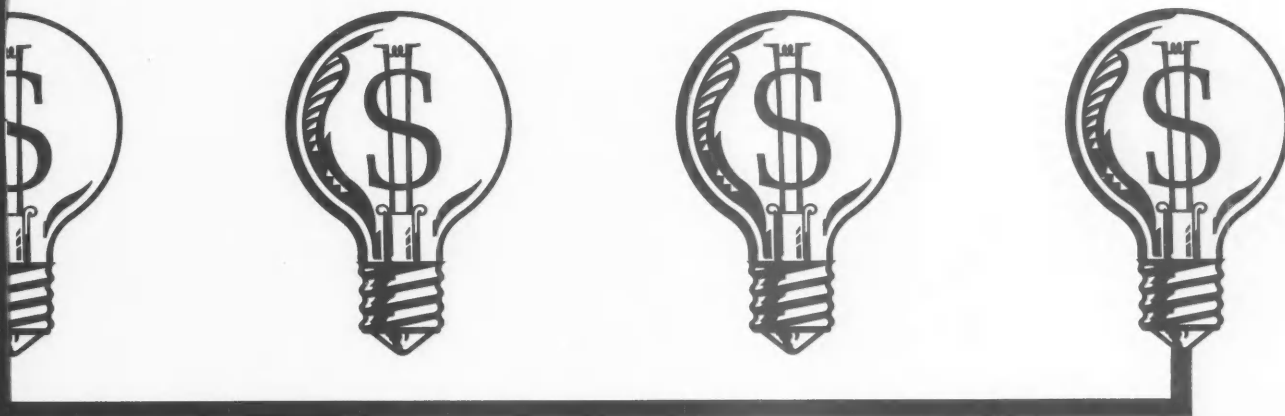
Like the 286-based model before it, the newest PW² uses a snap-on "personality pack" docking module that attaches to the back of the system's color or monochrome VGA monitor. Users of the earlier machine can upgrade by exchanging personality pack modules.

A more conventional CPU design is offered in the PW² 3163 PC, a 32-bit, 16-MHz, 386SX-based CPU. The system supports up to 32M bytes of total memory or up to 510M bytes of small computer systems interface (SCSI) disk storage.

VGA graphics, memory, disk and SCSI hard disk control are integrated on the motherboard, which has three 16-bit expansion slots.

Pricing ranges between \$2,500 and \$3,400, depending on configuration.

With Hardwired Internetworking,
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Tandy shows multimedia gear

BY RICHARD PASTORE
CW STAFF

NEW YORK — At Tandy Corp.'s product briefing earlier this month, a dramatic side-by-side comparison of a conventional cassette player and a prototype digital audio cassette player rocked the house far more than news of upcoming computer products.

Nevertheless, Tandy provided previews and plans for pen-based computing, multimedia and home and education markets. The products shown are "days to months away" from introduction, Chairman and Chief Executive Officer John Roach said.

Tandy subsidiary Grid Systems Corp. already said it will support both Microsoft Corp.'s and Go Corp.'s pen-based operating environments. However, Grid President Alan Lefkof said IBM Personal Computer compatibility will remain the core of the firm's pen-based hardware.

Lefkof also differed with Microsoft and Go by espousing far fewer pen gestures and lower minimum memory specifications than other companies have pro-

posed. Grid claimed 10,000 users for its Gridpad tablets.

On the new product front, Grid is developing a notepad PC that will feature a true hard disk rather than the CMOS cards currently employed. Grid is working with Conner Peripherals, Inc. and Prairietek Corp. to design a drive that will operate while the user walks around and will deliver the fast spinup time required for pen applications.

Other offerings

Following up its multimedia partnership kickoff with Microsoft, Tandy promised several 1991 introductions that will meet the specifications set forth last fall. Both a native multimedia-equipped PC and PC upgrade kits will be launched soon, said Howard Elias, vice president of computer merchandising.

Last month, Tandy opened a Multimedia Technology Center in Fort Worth, Texas, to serve as a resource for developers.

The Tandy 1000RL, Tandy's answer to IBM's Personal System/1 home computer, is in store for a face-lift. The machine's Intel Corp. 8086 chip will be boosted to a 10-MHz 80286

chip, and the IBM Color Graphics Adapter will be upgraded to IBM's Video Graphics Array.

In the PC software arena, Tandy is now testing enhancements to its Deskmate application suite that will allow voice recording and playback and PC-based home-appliance control.

With the addition of a microphone and voice-processing utility, a Deskmate Home Organizer Companion user can record messages on his PC, which will play them back on demand in the user's slightly mechanized voice.

Using the common power-line modules sold in electronics stores, users will also be able to control their lights and other household appliances via an icon-based household blueprint program.

In the education market, Tandy announced a new version of the Schoolmate networked system. For \$1,500, Schoolmate Plus will link PCs located beyond a single classroom.

The distributed network now supports multiple servers and remote printing as well. The network interface was designed to facilitate transparent access by nontechnical administrators.

Opus offers add-in board

Tool allows PC to operate Unix with MS-DOS

MOUNTAIN VIEW, Calif. — Opus Systems, Inc. recently announced an add-in board that further blurs the distinction between workstations and personal computers. The board allows a PC to run Sun Microsystems, Inc.'s version of the Unix operating system concurrently with the MS-DOS operating system at 15.8 million instructions per second.

"We assume you have an existing PC that you're not going to throw away, but [you] want ac-

cess to Unix speed and applications," said John Chun, director of marketing at Opus.

For high resolution, a second monitor can be added to the PC, according to Chun. It can support Sun's graphical user interface in the Microsoft Corp. Windows 3.0 environment.

Pricing for the board, called the Opus Series 500 Personal Mainframe, starts at \$6,495 without memory.

It can support up to 64M bytes of memory.

Iris series upgraded

Silicon Graphics, Inc. recently announced new high-end systems that, according to the company, top out at 286 million instructions per second.

The company announced faster versions of its Iris Power series, which incorporate three-dimensional graphics and movement.

The Iris 4D/400 line goes from one to eight 40-MHz processors. It has a Specmark (the System Performance Evaluation

Cooperative, a benchmarking consortium) multiprocessor Thruput rating of 159 and a single processor Specmark speed rating of 26.6.

The new computers can be used either as high-performance workstations or as multiuser graphics servers, according to the company.

Priced from \$64,900 to \$224,900, the computers can also be board upgrades for Silicon Graphics 4D machines.

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Dial-Up Internetworking is the most cost-effective way to extend your enterprise network to the smaller, remote workgroups that comprise the bulk of the internetworking market. It uses the general switched telephone network, limiting the need for the high-performance T-1 lines and high-speed routers that drive up conventional internetworking costs.

Dial-Up Internetworking is made practical by another Telebit® first — a powerful automated dial-up router called NetBlazer. NetBlazer provides low-cost



NEW PRODUCTS

Software applications packages

Applix, Inc. has announced a Unix System Laboratories, Inc. Open Look version of Asterix, its suite of desktop productivity applications for Unix workstations and X Window System terminals.

The applications enable users to create compound documents such as memos, letters, reports and presentations. Users of Sun Microsystems, Inc. Sun 03 or Sparcstations or Digital Equipment Corp. Decsystem, Decstation or reduced instruction set computing-based Ultrix systems can reportedly integrate Asterix with other applications.

The complete product suite is priced at \$995; a version that does not include spreadsheets costs \$695. The suite began shipping last month.

Applix
112 Turnpike Road
Westboro, Mass. 01581
(508) 870-0300

QQQ Software, Inc. has unveiled an enhanced version of TP Tables, a personal computer program that enables users to gen-

erate presentation-quality tables with only a few keystrokes.

TP Tables allows projects that previously would have to be performed on a mainframe to be run from a PC. It runs on PCs under DOS or Unix and on IBM RISC System/6000s under AIX. Single-user license fees for DOS versions cost \$895.

QQQ Software
302 N. Irving St.
Arlington, Va. 22201
(703) 528-1288

Wordperfect Corp. has announced Wordperfect 2.01 for Macintosh, an enhanced version of its software package for Apple Computer, Inc. Macintosh systems.

Version 2.01 enables users to transparently import documents created with Microsoft Word 3.0 or 4.0 from Microsoft Corp. Exports for Claris Corp.'s XTND and Wordperfect 4.2 for DOS have also been added.

Users of Wordperfect 2.0 can upgrade to Version 2.01 for \$17.50.

Wordperfect
1555 N. Technology Way
Orem, Utah 84057
(801) 225-5000

Welcom Software Technology

Corp. has released an upgrade to its Open Plan project management software package.

Open Plan 4.0 (\$4,200) features project executive, a graphical interface that enables users to view data from three perspectives: Work Breakdown Structure view, Project Network view and Barchart and Histogram view.

The Adobe Systems, Inc. Postscript-compatible package reportedly allows users to schedule up to 10,000 activities, 256 calendars and unlimited resources per project.

Welcom Software Technology
15760 Ventura Blvd.
Encino, Calif. 91436
(818) 990-1235

Development tools

Alpha Software Corp. has announced a development language designed to allow users to create memory-resident applications, integrate diverse DOS applications and automate complex or repetitive tasks.

Alpha RPL is a resident programming language that is positioned between an application, screen and keyboard. It can intercept keystrokes and read screens. The product's symbolic debugger, librarian and editor

are all memory-resident.

Alpha RPL for DOS runs on an Intel Corp. 8088-based IBM Personal Computer XT, AT or compatible equipped with hard disk. It costs \$595.

Alpha Software
One North Ave.
Burlington, Mass. 01803
(617) 229-2924

Data storage

Computer Modules, Inc. has announced an IBM Personal Computer AT bus-compatible non-volatile memory board designed to emulate a hard disk.

Flash Disk can be programmed and erased in a personal computer and features the following data transfer rates: 2M byte/sec. (read), 128K byte/sec. (write) and 40K byte/sec. (erase/write).

The board can be equipped with four, eight or 16 single in-line memory module sockets. Pricing ranges from \$695 to \$995, depending on version.

Computer Modules
2348C Walsh Ave.
Santa Clara, Calif. 95051
(408) 496-1881

Board-level devices

Datam Ltd. has announced a

100mm by 160mm Bitbus II to small computer systems interface (SCSI) bus module that can be mounted on a desktop system.

The DDCM2240 SCSI Bus to Bitbus II Interface Module incorporates an Intel Corp. 80C152 microprocessor and features 32K bytes of random-access memory.

The product costs \$1,995.

Datam
16 Concourse Gate
Nepean, Ontario
Canada K2E 7S8
(613) 225-5919

Tekstar Systems Corp. has introduced Costar, an IBM Personal Computer AT bus add-in accelerator/coprocessor board designed for Intel Corp. 80386-based systems.

The board's interface architecture is said to enable the product to transfer data between Costar and an 80386 CPU at rates of up to 33M byte/sec. while both CPUs are running at full speed.

Costar is available at an introductory price ranging from \$4,000 and \$6,000, depending on type of CPU.

Tekstar
2415 Parview Road
Middleton, Wis. 53562
(608) 836-7890

WAN capability on TCP/IP networks, supporting dial-up lines. It's the first product to combine the full suite of open systems standards in high-speed modems with those of TCP/IP internetworking.

NetBlazer uses the complete Telebit family of high-performance modems to connect remote locations in your organization together in a virtual wide area network, giving remote users transparent access to all network computing resources at a far lower cost than is possible with conventional internetworking technology. It complements the high-speed routers that move information over the corporate backbone.

Additionally, NetBlazer acts as a terminal server or modem pool. It can route Ethernet to Ethernet.

And can even use 56K leased lines.

WAN IP routing over dial-up is incredibly fast, thanks to NetBlazer's support for standard SLIP and PPP protocols combined with advanced techniques like TCP/IP header compression.

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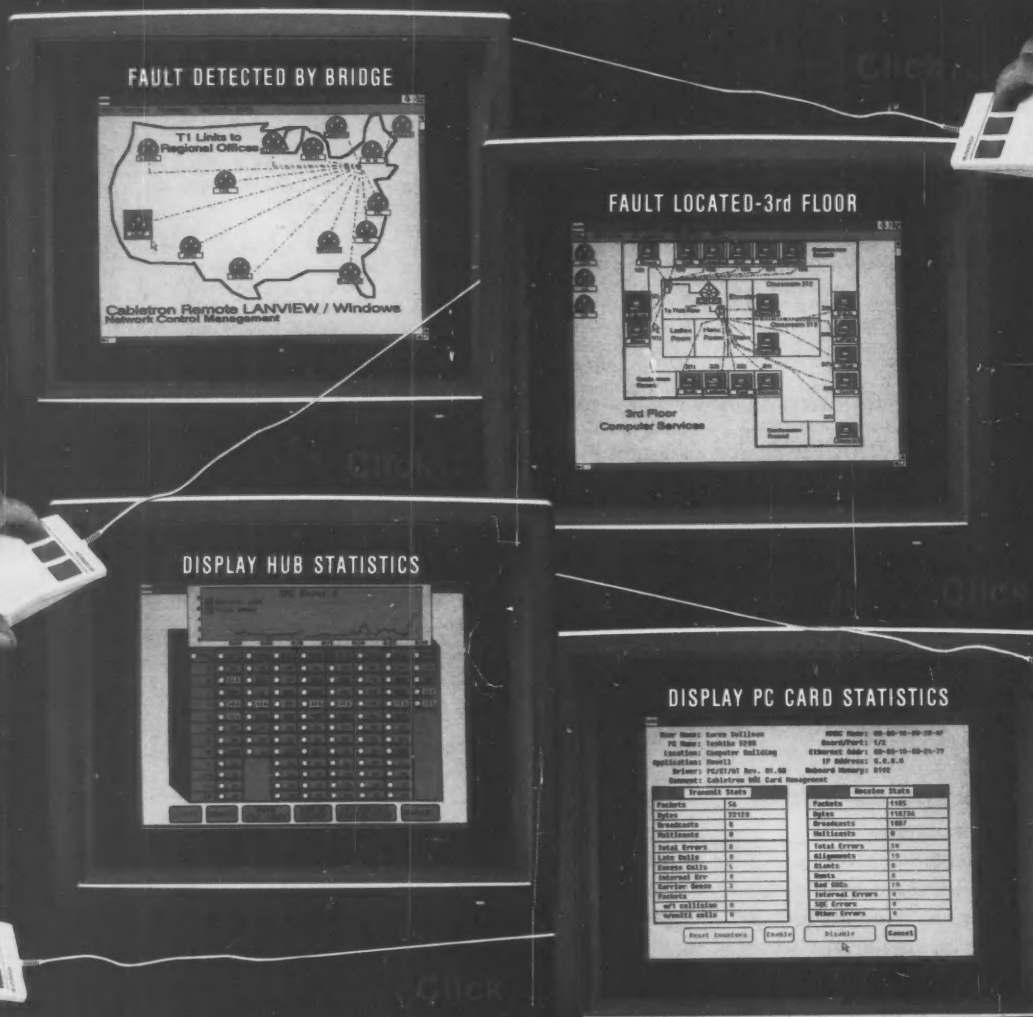
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NETWORKING

Distributed computing arises

Business world begins to buy into a once-esoteric systems philosophy

BY ELISABETH HORWITT
CW STAFF

Distributed computing may finally be breaking out of academic and scientific enclaves and into the business world. While information systems managers still see major difficulties in moving their corporate applications and systems to the innovative technology, more and more of them are starting to explore its potential benefits in limited or pilot installations.

McDonnell Douglas Corp. is working toward a corporatewide distributed environment that ideally would allow the user to "sit down at the workstation suitable for the job and get any data and function he needs, wherever it is within the network and whatever vendor platform it resides on, hopefully transparently," said Jack Jones,

director of distributed computing services at McDonnell Douglas Aerospace Information Services Co.

McDonnell Douglas has a long-range plan in place for rolling out distributed computing systems corporatewide, Jones said. However, the pace at which this rollout will proceed will vary from year to year according to the business needs of individual business units and discretionary funding available for the project, he added.

The aerospace firm is looking forward to the emergence of standards for implementing the technology across multivendor platforms and tying existing applications to the new platforms, Jones said. However, lack of standardization and other technical barriers have not impeded McDonnell Douglas' progress toward distributed computing

and will not do so as long as the business demand and financial resources are in place, he added.

Historically, business users have avoided distributed computing because of the need to hire specialized programmers to build applications platforms from scratch, primarily on Unix systems, analysts at The Yankee Group and CIMI Corp. agreed.

However, the esoteric technology has recently shown signs of entering mainstream corporate America, particularly in the investment and manufacturing sectors. Eastman Kodak Co. said it is working on distributed computing applications but added that the area is too competitive to be discussed publicly. Salomon Brothers, Inc. reportedly started looking at distributed computing several years ago and recently went so far as to pur-

Continued on page 56

To each its own

Distributed computing is an object-oriented technology that allows applications to be broken up into subtasks, which are then distributed to whichever system on the network is best suited to a given task. What follows is an explanation of the different elements that make this possible:

Remote procedure call (RPC): A mechanism that allows a program residing on one system to execute a task or access data on a remote system transparently, as if it resided on the same system. Different systems working on the same application collaborate via RPCs.

Directory/naming service: Keeps track of various data, applications and service resources on a distributed computing network.

Location broker: Automatically matches a client query with whichever server has the most suitable services, data and computing resources to accomplish the task.

Object-oriented: A concept that treats applications, data, networks and computing systems as objects that can be mixed and matched flexibly rather than as components of a system with built-in relationships. As a result, an application need not be tied to a specific system nor data to a specific application.

ELISABETH HORWITT

Cable channel discovers wonders of PC networks

ON SITE

BY JIM NASH
CW STAFF

BETHESDA, Md. — For some people, it is difficult to believe that anything on television is more popular than the ubiquitous MTV, but as of last month, The Discovery Channel had more subscribers than the metal-and-lace station.

That is not bad for what some consider to be a relatively high-brow format of science and educational programs running 18 hours per day. This June, Dis-

covery will turn a precocious six years old. Perhaps the only aspect of the company that has grown as quickly as its subscriber base — it was cited in 1988 by A. C. Nielsen as the fastest growing cable station in history — is its personal computer network.

"When I started [at Discovery] 3½ years ago, we had five typewriters and three PCs," recalled Gary Smith, manager of the station's network operations. "Today, we have five typewriters and about 400 computers."

Smith and his boss, Systems

Development Vice President Fred Bonner, were hired when management at Discovery decided they would need linked computers to control and nurture the explosive growth the company was experiencing. "Everyone [in the computer industry] recommended that I go out and buy a minicomputer in a hurry," Bonner said.

Either because of or despite their advice and the years of experience he had working with minicomputers and mainframes, Bonner began to build a nationwide PC network running Novell, Inc. Netware. "The writing was on the wall," he said. "Networks were becoming more affordable and dependable."

Smith said it is no coincidence that the station began to boom in 1988, the same year PC networks were installed. Discov-



Bonner: Networks support major growth

ery's commitment to office automation almost requires PC networks. "I can write software

shut down

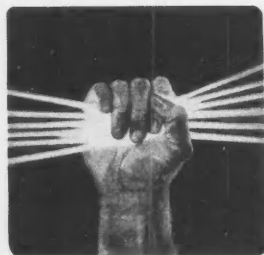
the entire headquar-

ters system." Continued on page 56

and build databases much quicker for PCs," Smith said. Equipment is easier to update and replace, reducing maintenance and support costs, he added.

The transition from typewriters to PCs was not always smooth, however. Smith said that during one conversation with Bonner and other information systems employees about network security, someone put his hand down on a server and accidentally

Continued on page 56



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CA takes steps to embrace DEC's Polycenter

Multivendor systems management platform gains support from software supplier

BY ELISABETH HORWITT
CW STAFF

Computer Associates International, Inc. has announced plans for its systems management products to complement, extend — and to some extent, compete with — Digital Equipment Corp.'s multivendor systems management platform, Polycenter.

CA, along with several other systems management application vendors, promised at the Polycenter introduction earlier this month to support the platform via

DEC's Network Application Support (NAS) protocols and application programming interfaces.

NAS is a portfolio of various protocols that form DEC's platform for integrating its own and other vendors' systems and applications.

CA announced several NAS-compliant DEC systems management applications last April, as part of its Computing Architecture for the '90s strategy. Those products, now in beta test, will be part of CA's strategy for providing systems management across IBM and DEC systems. The

applications include CA-PMA/Chargeback for VAX, which provides resource accounting and chargeback; CA-1 for VAX, which provides tape library management; and CA-7 for VAX, which does job and resource scheduling.

CA intends to support DEC's Polycenter and IBM's Systemview systems management platforms as future industry standards, according to Kurt Seibert, the software vendor's vice president of research and development. CA's applications will complement those offered by the two host vendors, Seibert said. How-

ever, CA is also offering its own multivendor systems integration product line to users who are not willing to wait for IBM's and DEC's strategies to become commercial reality.

Indeed, CA is already beginning to provide some degree of integrated management across IBM and DEC systems, Seibert said. "Users can control a VAX/VMS from an IBM mainframe, collect VAX security alarms and send alerts up to the IBM side via our products," Seibert said. CA also offers a repository for security information and is moving toward integrating scheduling products across DEC VMS and IBM MVS systems, he added.

CA is also developing Hewlett-Packard Co. HP-UX systems management software, which eventually will be integrated with the DEC and IBM products, Seibert said. "The goal is to manage, control and monitor all system-related activities across IBM MVS, VSE and VM, DEC VMS and HP-UX systems."

California vision

The California legislature is one organization that has "invested in CA's vision for integrated systems management," said Joe Papa, a systems software specialist for the legislature. CA's promise to provide systems management across DEC and IBM "is exactly why we went with them," he added. "When we went with IBM, they said they had this vision, too, but it stops where the IBM line is drawn, and the same is true of DEC."

The legislature has implemented CA tools for scheduling jobs and automating operations. "The whole point is to use them to integrate standardized functions that all big data centers have, under one umbrella," Papa said.

CA's promise to integrate its applications with Polycenter is of interest to the legislature, particularly if it means that CA applications will feed into Polycenter's information repository, Papa said. "We are looking for a centralized information base, and we can have it both ways if CA supports both Systemview and Polycenter."

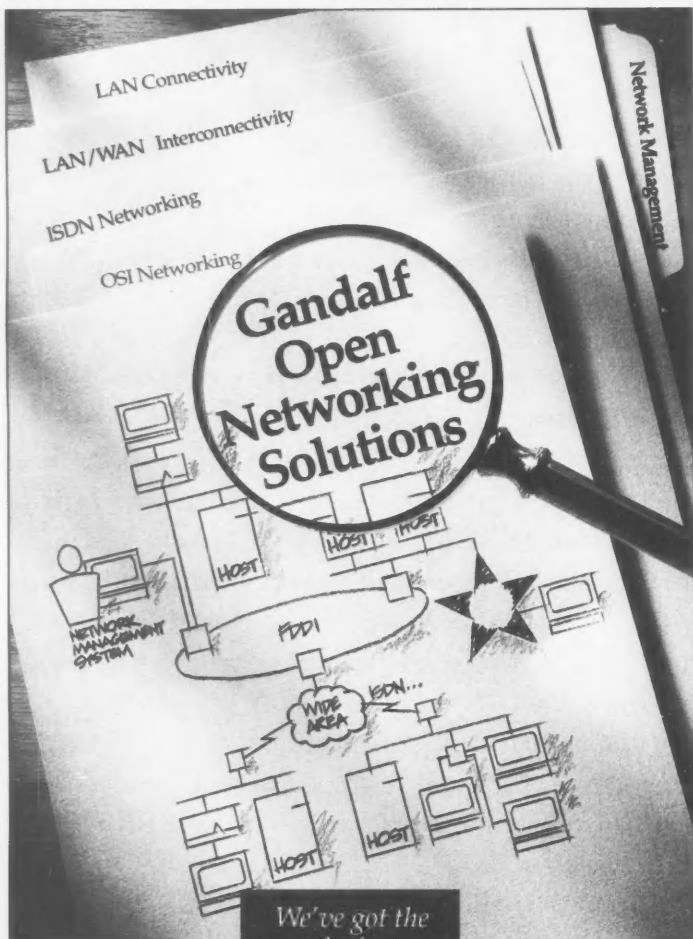
CA has yet to commit to that level of integration with Polycenter, although it is evaluating such a move, Seibert said. However, the company's VMS products all support the Open Software Foundation's Motif front end and SQL-based querying that DEC supports with its management platform, he added.

Polycenter also picked up the following third-party allies:

- Applied Information Systems, Inc. in Chapel Hill, N.C., announced it will extend Polycenter's systems management capabilities to a variety of Unisys Corp. hosts, via its Burcom and Ulysses lines of Unisys gateway products. Applied Information Systems also intends to enhance its products so DEC Management Control Center Director can manage Unisys network environments.

- Raxco, Inc. in Rockville, Md., announced Polycenter support for its Clyde-sentry, Security Toolkit and Prosupport security management products. Raxco also committed to moving the products to the Ultrix platform.

- UIS, Inc. in Lexington, Mass., announced that it will support NAS and Ultrix with its VAX-based accounting and chargeback systems. These include UIS-PACS for resource management accounting, UIS-Archive for file retrieval and storage management and the UIS-Manager systems management environment.



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Third-party software helps maximize RS/6000 power

BY JOANIE M. WEXLER
CW STAFF

MONTREAL — A seemingly innocent piece of software from a third-party vendor is allowing a large credit union to leverage the IBM RISC System/6000 workstation as the cornerstone of a half million dollar file transfer project set to go into production next month.

La Confederation de Caisses Populaires et d'Economie Desjardins du Quebec is a \$40 billion computer services bureau that manages 20 million accounts for customers of 1,400 independent credit unions in the province.

Electronic payroll deposits currently funneled to the company's IBM MVS mainframe-based data center through two IBM Personal System/2s are now peaking at 350 transactions per second, according to Leslie Satenstein, the project's leader.

The burgeoning dial-up traffic requires the transfer of about 2M bytes of data per second, which consumes more processing power than the PS/2s can handle, Satenstein said. La Confederation has chosen an RS/6000 running at 27.5 million instructions per second (MIPS) to replace the PS/2s.

In addition to the workstation's horsepower and Unix base, the platform was chosen because of the emergence of software that allows fast, unattended bidirectional RS/6000-to-mainframe file transfers.

Advanced communications

Since December, La Confederation has been testing the MLINK Advanced Program-to-Program Communications System (Macs), which officially started shipping last month from \$1.5 million company Computer Microsystems, Inc. in Lebanon, N.H.

Although it represents a tiny percentage of the dollars invested in the file-transfer upgrade project, Satenstein said, Macs was the first domino to fall in allowing the firm to choose the RS/6000 as its security liaison between dial-in customers and the data center's multiple IBM 3090 mainframes.

Macs allows the disparate computers to initiate a session, transfer files and submit commands for execution by a remote system. Communications can flow in either direction and are unattended. To date, no similar product is available from IBM, Satenstein said.

Although he hears such a product is in the offing, "IBM announcements generally precede availability, and of course, IBM pricing is much different," Satenstein commented. "This you can't beat for the price."

The bidirectional communications utility is available from Tandem Computers, Inc. to allow its Cyclone mainframe-class minicomputer to intercommunicate with IBM mainframes. However, the Cyclone runs at just 9 MIPS, according to Satenstein.

The bidirectional flow, he added, is key because file transfers are tracked and logged every step of the way throughout the network. Once an electronic payroll deposit reaches the banking application

on a mainframe, the mainframe must be able to communicate the status of the job that was executed for the customer back to the RS/6000.

In addition to the RS/6000 and the Cyclone, La Confederation considered an IBM mainframe, X.25 packet switch and OS/2-based local-area network as PS/2 replacements.

However, "these would have been too costly for our clientele and for us," Satenstein explained. "If you ask customers to

transmit via X.25 or [Systems Network Architecture], they have to buy a \$1,000 card for their computer and spend \$1,000 for a special type of modem. With a LAN, we'd have to equip all the PCs with the largest possible hard disk to handle all the customers."

"With this system," Satenstein continued, "we just give our customers the communications software free, and the most they have to invest is \$150 for a modem if they don't already have one."

Modem manager

The electronic file transfers reach the RS/6000 over dial-up telephone lines front-ended by a Digital Pathways, Inc. Defender "callback box."

Defender manages modems running

the gamut of speeds up to 19.2K bit/sec. The box receives a call, checks a database on the RS/6000 and dials back the customer.

When the callback is complete, communications begin, and file transfers are tracked and logged at every juncture.

Satenstein said the RS/6000's Unix base was important because "we were looking for a Unix-to-Unix data transfer capability to satisfy 500 potential Unix customers. We know the market is there; it's just waiting for us."

Satenstein added that the 500 would-be Unix customers are above and beyond the minimum 2,000 customers the credit union expects to be serving within the year — more than 10 times the 200 customers it now serves.

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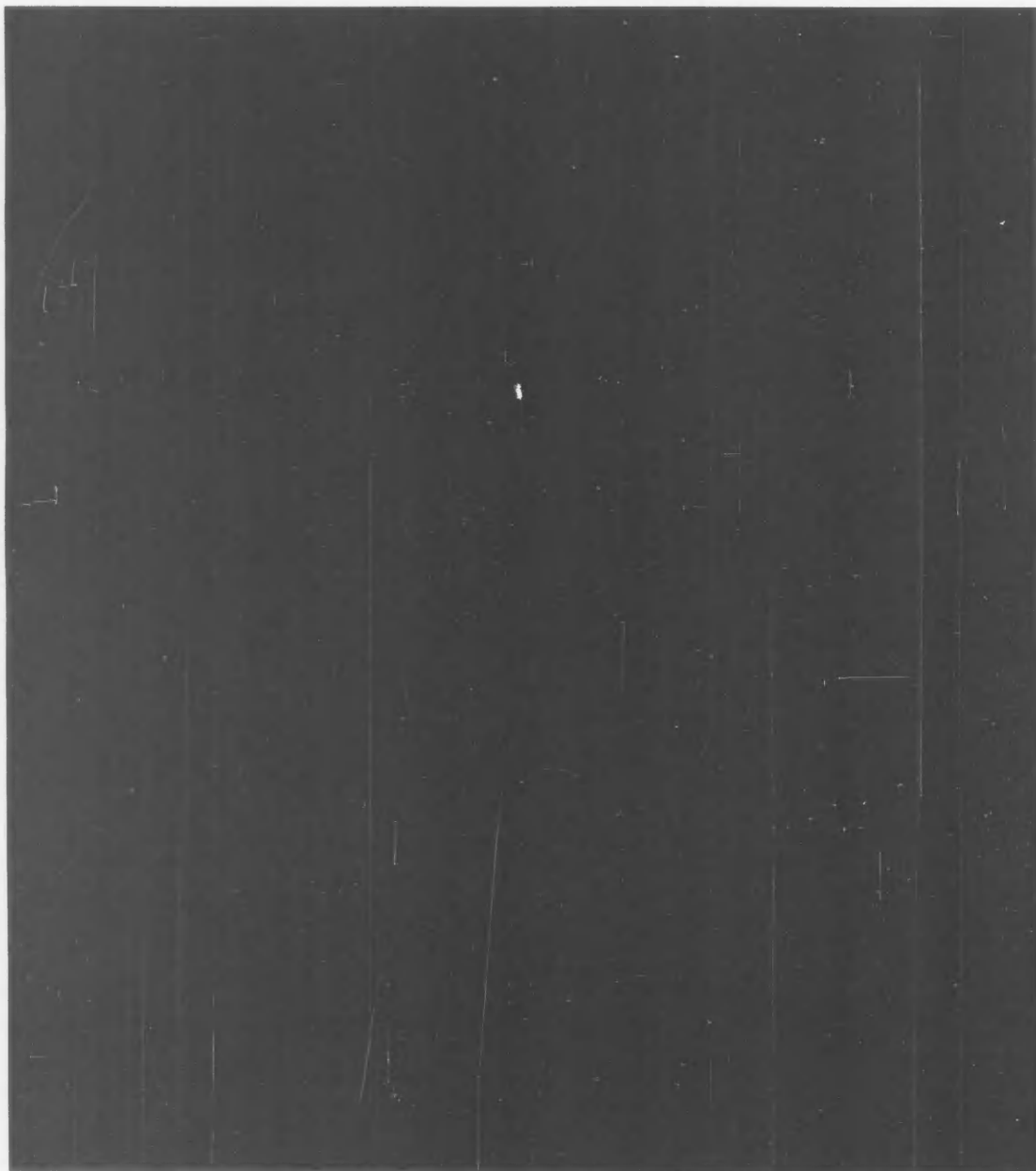
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An offer they couldn't refuse

Local agency plans for private network made Centel answer with FDDI

BY MARYFRAN JOHNSON
CW STAFF

TALLAHASSEE, Fla. — As the city and county governments in this muggy, sprawling capital city were getting ready to install their own fiber-optic network last year, bells began ringing loudly at nearby Centel Corp.'s Central Telephone Company of Florida — and it wasn't Avon calling.

Here were Centel's biggest customers gearing up to bypass the local phone company with their own Fiber Distributed Data Interface (FDDI) network and planning to install \$140,000 worth of network hardware from Digital Equipment Corp.

"Then Centel stepped in and made us an offer we more or less couldn't refuse," said James Hines, geographic information systems coordinator for Leon County, which bought several Decstation 5000 workstations but canceled its FDDI equipment orders from DEC.

Instead, the city and county became the ground-breaking customers last November for Centel's FDDI metropolitan-area network — the first such tariffed offering of an FDDI network by a local exchange carrier in the U.S. Centel is Florida's

fourth-largest phone company.

More than half the state's computer power is concentrated around Tallahassee because of the presence of state government, universities and the Florida State University supercomputer research institute. Until last year, though, Centel had nothing to offer customers who needed the wider bandwidth of high-speed data networks.

"People were going off doing their own thing," Hines said. "DEC was putting in fiber, AT&T was in town putting in fiber, and Florida State University was running its own fiber, mostly because Centel didn't offer any kind of reasonable deal. They didn't even seem interested."

Centel's about-face on the issue came about through a concerted effort by transmission engineers Bill Price and Jay Westmark and their boss, Ken Bazo, who convinced upper management that offering FDDI services was a critical step forward for the company.

"Centel knew where the market was heading, and we had prepared ourselves with two years of research into FDDI," said Bazo, manager of engineering transmission. He estimated that the new service will make a profit for Centel within three years.

"It was in our best interests. If we didn't do this, someone else would have," said David Farmer, general operational planning manager at Centel.

"This makes the phone company more attuned to the customer and his needs," Price added.



Centel's MAN team: Westmark (left), Bazo (center) and Price find a way to keep local customers from building their own network

ed. "It's a good alternative to putting in microwave towers at enormous expense or pulling your own fiber."

Hines agreed. "I didn't want to be in the communications business," he said. "We ended up saving the \$140,000 on the front end, and our monthly bill

from Centel is just about what our monthly maintenance would have been on that DEC hardware we didn't have to buy."

Although the cost will increase for a customer if Centel has to lay additional fiber in the ground, the average customer pays a onetime installation fee of \$1,057 and a monthly FDDI service fee of \$368.

"Our goal is to offer the service at such a reasonable price, the customers can't afford not to

networked DEC workstations. Ethernet, with its 10M bit/sec. transmission speed, was too easily bottlenecked by the high volume of images, data and bulk files that had to move on the network between city hall, the county courthouse and the city's electrical department several miles away.

Centel was able to provide a relatively low-cost way to connect the three government buildings via single-mode fiber-optic cable. That allowed the FDDI to be deployed as a wide-area network rather than merely as a backbone for local-area networks.

The key to the project's success for Centel was finding converter devices that could take the customer's multimode signal — which can travel a maximum of 2 kilometers between nodes — and turn it into a single-mode signal with the ability to stretch 40 to 50 kilometers between stations.

With multiple counterrotating, self-healing FDDI rings that extend from the central office to customer sites, the network was designed to reroute the data flow automatically and without interruption if a cable is cut or damaged. The rings are bridged to a series of backbone rings, each with major hubs located in geographically strategic Centel offices. Network security is not an issue, Price said, because only Centel is allowed to attach equipment directly to the FDDI rings.

Cable

FROM PAGE 49

Bonner and Smith chose Novell's Netware as the operating system for the shielded twisted-pair Token Ring network in Bethesda with Proteon, Inc. Pronet-10 Token Ring interfaces. As Discovery offices opened in New York, Chicago, Los Angeles, San Francisco and Detroit, they were connected with Proteon routers and T1 links. Today, Discovery uses five servers running Netware Version 3.1 and two with Version 2.15, Smith said.

Here, too, Discovery learned inadvertent lessons. While installing the Proteon equipment for the first time, Smith said, the network showed repeated errors. While they eventually tracked the problem down to a wiring fault, Smith said it took three or four weeks of wiring before they got it right.

"We basically run the company on the back of a PC network," Bonner said. "We knew we were going to have a database-heavy network" and built accordingly, he said. The Pronet-10 transmits data at 10M bit/sec., and the company is moving up to a 16M bit/sec. version this year.

"It's not huge by [IS] standards, but we have 20 or 30 users at a time querying 10 to 15 specialized databases from their workstations," Bonner explained. One heavily accessed database — the master program schedule listing every commercial, program and promotion to be broadcast — weighs in at 90M bytes. However, not all the data transmitted is strictly for in-house work.

"We're a very marketing-oriented company. We are doing more and more with our own publications," Bonner said. For instance, Discovery has published its own monthly program magazine since 1986. That magazine, according to the station, briefs its 200,000 subscribers on programs.

From articles to advertisements to 2d contracts, the magazine is generated by Discovery employees sharing information across the country. The same goes for the planning, building and broadcasting of its program schedule, Smith said.

Traffic during the day is highly interactive, Smith said. At night, automated archiving is conducted. When not querying the databases, he said, employees are transmitting contracts, solicited and unsolicited program proposals, program updates and other information.

Distributed

FROM PAGE 49

chase object-oriented networking tools from Netwise, Inc.

"Our users are practically nowhere [with distributed computing applications], but all of them are telling us that they want to start kicking tires on this," said Wayne Kernochan, a senior analyst at The Yankee Group. Developers that are keeping up with the Open Software Foundation's (OSF) development of the Distributed Computing Environment (DCE) should begin introducing DCE-based applications by the middle of next year, he added. By 1993, he continued, "there should be a real ground swell of distributed, object-oriented applications."

The technology has recently gained some much-needed credibility — and publicity — through the involvement of leading network and computer vendors in standards bodies such as the OSF. In addition, users of early distributed computing installations have had time to realize significant paybacks from their systems.

Allied-Signal, Inc.'s Autolite Spark Plug Division, for example, used Netwise's Remote Procedure Call product to set up real-time links between factory-

floor collection systems and Oracle Corp. database servers [CW, Nov. 19, 1990]. The system played a key role in Autolite's 13% productivity increase in 1989, making it the most productive unit in Allied-Signal's automotive sector.

The Equity Investments Group at Putnam Cos. in Boston recently implemented a distributed computing platform on Sun Microsystems, Inc. workstations that allows the development of applications to evaluate the performance of client accounts in one week instead of a few months, as formerly, said Steve Levy, who worked on the project.

However, while these success stories may encourage other companies to experiment with distributed computing, they have yet to persuade the parent firms to extend the technology to other parts of the enterprise.

In an earlier interview, Carole Pritchard, Allied-Signal's automotive sector director of IS, told *Computerworld* that her group will look at adapting parts of Autolite's system for its own use. However, this will depend in part on whether various aspects of the systems can be supported by IBM Application System/400s, which are a major part of the sector's current systems strategy, she indicated.

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NEW PRODUCTS

Local-area networking hardware

Chipcom Corp. has announced a fault-tolerant Token Ring module designed for its Online system concentrator.

The Token Ring Multistation Access Unit Module is a single-slot device that connects eight desktop computers, servers or other network resources operating at 4M or 16M bit/sec. The product can reportedly integrate multiple Token Ring and Ethernet networks in a single Online System Concentrator. It also supports shielded and unshielded twisted-pair cabling. The product is priced at \$1,195. **Chipcom**
118 Turnpike Road
Southboro, Mass. 01772
(508) 460-8900

Local-area networking software

Information Presentation Technologies, Inc. has introduced a software package designed to allow Apple Computer, Inc. Macintosh and Sun Microsystems, Inc. Sparcstation users to access one another's respective files.

Sun-Partner (\$695 per Sparcstation) features a bidirectional, peer-to-peer connection between the Macintosh and Sun environments. The product reportedly enables Macintosh and Sun users to access networked devices such as printers and database servers simultaneously via Sun's Open Look or a Macintosh interface.

The company has also announced Ushare 2.0, a network application that creates an Appleshare server on a Unix workstation. Ushare 2.0 costs \$1,195 per desktop package. A desktide version is priced at \$1,595.

Information Presentation Technologies
5000 N. Parkway Calabasas
Calabasas, Calif. 91302
(818) 347-7791

Dayna Communications, Inc. has announced Novell, Inc. Netware 386 drivers for its DL2000 and DL/2 Localtalk adapters that were designed to support Netware for Macintosh Version 3.0.

The DL2000 standard bus and DL/2 are both Novell-certified adapters for Apple Computer, Inc.'s Localtalk. They are both equipped with a workstation IPX driver that allows personal computer workstations to access Netware management software, printing and file security utilities via Localtalk.

The DL2000 and DL/2 are priced at \$299 and \$399, respectively. **Dayna Communications**
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

Network management

Boole & Babbage, Inc. has announced a network operations and fault-management system that features a single point of monitoring and control for enterprise-wide and small information networks.

Net/Command Version 2.1 includes

real-time network maps, local-area network diagnostic tool management features, user-defined alerts and host-alarm management. The product also emulates a control terminal, thereby allowing network managers to monitor and control the performance of complex networks from a single workstation.

Pricing begins at \$55,000.

Boole & Babbage
4600 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 720-0231

Novell, Inc. has announced the Lanalyzer 4/16 network analyzer, a personal com-

puter-based network analysis tool for 16M bit/sec. Token Ring networks.

The product features predefined testing applications for Token Ring environments, such as automatic mapping, real-time error analysis and network optimization. It can be configured for 4M or 16M bit/sec. Token Ring networks by switching software in its setup menu, according to the vendor.

The Lanalyzer 4/16 lists at \$11,980. Users of the 4M bit/sec. version can upgrade to the 4/16 version for \$1,995.

Novell
2180 Fortune Drive
San Jose, Calif. 95131
(408) 434-2300

Codex Corp. has introduced a low-cost

network management system for small-to medium-size networks and a low-end T1 multiplexer to work with it.

The 9800 LE Network Management System, a scaled-down version of the 9800 series NMS, offers users an easily upgradable way to manage a wide-area network. The product manages Codex fast-packet and circuit-switch T1/E1 multiplexers, X.25 packet switches and packet assemblers/disassemblers as well as an Etherspan T1/LAN bridge. It is currently available in the U.S. and costs \$20,000.

The 6250 Network Multiplexer is a digital circuit switch interfacing with T1, E1, fractional T1 and n x 64 services. Pricing begins at \$4,000, with average price per node ranging from \$8,000 to

Continued on page 58

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information resources

*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."
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Continued from page 57
\$18,000. The product is currently shipping.
Codex
20 Cabot Boulevard
Mansfield, Mass. 02048
(508) 261-4655

Customer premises equipment

Themis Computer has announced a wide-area network controller designed for the Sun Microsystems, Inc. Sparcstation bus.

Sxcm is an intelligent X.25 data communications front-end processor for Sun's Sbus. It supports T1 and Conference on European Postal and Telecommunications, or CEPT, communications

rates and features three on-chip serial channels that can be independently programmed to support synchronous and asynchronous protocols, the vendor said.

Pricing begins at \$1,800.
Themis Computer
6681 Owens Drive
Pleasanton, Calif. 94588
(415) 734-0870

Modems

Hayes Microcomputer Products, Inc. has announced a 3-oz., 3-in. modem that can be connected to laptops or portable computers.

Pocket Edition 2400 includes a standard 9-pin RS-232 serial port and features 300, 1.2K or 2.4K bit/sec. data

communications rates.

The product is priced at \$179.
Hayes Microcomputer Products
705 Westech Drive
Norcross, Ga. 30092
(404) 449-8791

Gateways, bridges, routers

Jupiter Technology, Inc. has unveiled enhancements and additions to its NP 9600 family of communications servers.

The product line now features four new server models, interactive software support tools and local-area network interfaces.

The four servers include NPS models 9651, 9652, 9658 and 9659.

Pricing ranges from \$8,000 to \$48,000, depending on type of server model.

The company also announced 4M- and 16M-byte Token Ring interfaces that were designed to work on all NP 9600 servers. The interfaces cost \$1,000 each.

Jupiter Technology
2402 W. Beardsley Road
Phoenix, Ariz. 85027
(602) 869-3778

Systems Strategies, Inc., a subsidiary of Nynex Corp., has announced Express IP Router, a software package that allows Unix workstations running Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate over packet-switched wide-area networks.

The product runs in conjunction with the firm's Express X.25 public data network access package. Express IP Router users can extend TCP/IP services to remote locations at speeds of up to 64K bit/sec. without the expense of a dedicated line. The product is currently available for Unix 386 systems using Intel Corp.'s Unix System V/386, The Santa Cruz Operation's Unix and Interactive Systems Corp.'s Unix.

Express IP Router costs \$700.
Systems Strategies
225 W. 34th St.
New York, N.Y. 10001
(212) 279-8400

Micro-to-micro

Server Technology, Inc. has announced a telephone-activated power control unit that allows users of personal computers to control programs, files and printers from a remote, unmanned location, even when power for their remote systems has been turned off.

Remote Power-On/Off includes remote computing and file-transfer software that is bundled with a telephone-activated power controller that allows users to access a central PC and control its operations from a remote site.

The product can be installed on an IBM Personal Computer XT, AT or compatible. A bundled package that includes the controller and communications/control software costs approximately \$220.

Server Technology
2332-A Walsh Ave.
Santa Clara, Calif. 95051
(408) 988-0142

Front ends, multiplexers

Pacific Communication Sciences, Inc. has announced the CS8000 in its Clarity series voice/data multiplexer line.

The product, available now, has eight expansion slots, allowing voice, fax or modem transmission across low-cost digital lines. The CS8000 uses a proprietary voice coding algorithm that yields compression rates greater than 9-to-1. However, it delivers toll-quality voice reproduction, according to the company.

Voice channels may be equipped with Pacific Communication Sciences' Fax III fax option, allowing combination voice/fax transmissions through a single channel.

The base price is \$3,995, including four data channels in addition to the eight expansion slots. Voice cards cost \$1,595 each. Fax III cards cost \$2,195.

Pacific Communication Sciences
10075 Barnes Canyon Road
San Diego, Calif.
(619) 535-9500



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The background of the entire page is composed of large, bold, curved shapes in black and white. On the left, a large black shape curves from the top towards the bottom. On the right, a large white shape curves from the top towards the bottom, creating a sense of depth and movement. The text is positioned within the white curved area on the right side.

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operating system, most
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360,000 systems later, it can

Any time a computer company designs for the future, there's a very good chance it will miss the mark.

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So how do we explain the fact that corporations buy more servers and workstations from Sun than from IBM, H-P, Digital, or anyone else?

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First, Sun approached client-server computing with a clean slate. We had no old, proprietary technologies of our own to "fit in." That left us free to explore promising new concepts such as RISC processing, object management, and digital imaging.

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And third, we approached the whole subject of client-server computing a little differently than other vendors:

1) We put the focus of computing power wherever it can do you the most good — on the desktop, on the server, or split between the two.

2) We build everything into our systems that's needed for true client-server computing (RISC processing, multitask-

safely be said that our aim was true.

ing, Ethernet, e-mail, audio, a graphical user interface, and plenty of memory and storage).

3) We give you a simple, consistent way to work within applications, access files, print, send mail, and manage network resources.

4) We offload processing from host computers to servers and workstations — your system can grow without limits, and in less costly increments.

5) We integrate all of your company's computers, so you can draw upon the data, applications, and processing power of every computing resource on the network.

Different, perhaps. But is Sun's approach better?

You might want to direct that question to the several thousand companies that

own Sun systems:

Manufacturers, airlines, publishers, banks, investment firms, and insurance companies — as well as the engineers, programmers, and scientists who were among the first to reap the benefits of Sun computing.


These are, of course, very different kinds of businesses. With very different computing plans.

But this much they now have in common:

Faster performance. Lower costs. Longer hardware lifecycles. Less training. Shorter time-to-market. And higher workgroup productivity.

Granted, all that is a lot to take on faith.

So turn the page, and we'll tell you how to get the facts.



If this is the first you've heard of Sun's unique approach to client-server computing, we'd like to explain it all to you in greater detail.

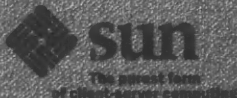
Simply call 1-800-233-7472, ext. 430, and you'll receive a package of information. We'll also invite you to meet with

a Sun representative.

The more you learn, the more you'll understand something very important about Sun:

For us, client-server computing was not only a matter of vision.

It was also a matter of aim.



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MANAGER'S JOURNAL

EXECUTIVE TRACK



Jonathan J. Burbank has been promoted to vice president of U.S. information services at

Bull HN Information Systems, Inc. in Billerica, Mass.

Burbank will develop and direct business and technical information systems for Bull in North America. He will also be responsible for aligning Bull's strategic IS direction in the U.S. with the overall IS strategies of its French parent Groupe Bull.

He reports to Sy Kraut, executive vice president of manufacturing and corporate services, with dotted-line reporting to Robert J. Elliott, vice president of information services.

Burbank was most recently Bull's director of application development systems and support. He joined the computer vendor in 1989 as director of information planning and technology.

He holds a bachelor's degree from Williams College in Williamstown, Mass.

.....
Howard Van Valkenburgh has been named director of MIS at **GF Office Furniture Ltd.** in Gallatin, Tenn. He is responsible for all computer operations, applications development, communications and personal computing at the firm.

Van Valkenburgh was most recently a project manager at Service Merchandise, Inc. in Nashville. Before that, he was a project manager at First American National Bank, also in Nashville. He also worked for 10 years as a senior systems analyst at Consolidated Freightways, Inc. in Portland, Ore.

He holds a bachelor's degree in business administration from Memphis State University.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Homequity puts users in control

A bent for decentralization is having an impact on technological 'balance of power'

BY ELISABETH HORWITT
CW STAFF

While a lot of companies talk a good game about decentralizing information systems operations and putting more computing tools in the hands of users, PHH Corp.'s Homequity division is one organization that seems to be making it work.

The Wilton, Conn.-based corporate relocation and real estate management firm has been pushing user empowerment for the past couple of years, wreaking some fundamental changes in the balance of power between IS and end users.

"It's up to IS to make a system available, and then it's up to each business unit to decide whether it wants that system and justify the costs," says Bradley J. Calcagni, Homequity's director of business systems development, technology management and consulting. "We're not pushing it down their throats."

"Under the old way, IS would say to users, 'Here is the new system. You paid for it, use it,'" says Stephen Pratt, project leader of departure applications systems. "Now we can only say, 'Here's a tool; this is what you'll be buying.'"

In the past 18 months, management has demonstrated its commitment to

user empowerment in two concrete ways. First, it has backed the development of two highly strategic systems that move crucial database and application resources off the centralized hosts onto personal computer local-area networks — and effectively into users' hands.

Second, management is giving users

properties of corporate employees who are being relocated to another part of the country. One way for the firm to keep its competitive edge as a "high-end" business, management decided, was to provide clients with exactly the information they want about the status of their properties, what measures are being taken to sell them, and why a given marketing strategy was chosen.

Into users hands

Homequity concluded that it would have to find a replacement for the current Wang Laboratories, Inc. VS reporting system, which lacked the flexible data structures and reporting tools that were needed to tailor reports to clients' needs. A group appointed to evaluate possible solutions had gotten as far as looking at SQL-based LAN servers when users took matters into their own hands.

Homequity's research analyst department, which generates customer reports for business unit managers, had been working with Pratt to develop a PC-based database server for pricing and statistical analysis. The system runs

on Novell, Inc. Netware Token Ring LANs.

The research analysts realized that this system could also support customer reporting and told Pratt they wanted to use it that way. "What sold

Continued on page 68



Homequity's Bradley J. Calcagni says IS should be in the business of making a system available to end users, not 'pushing it down their throats'

the chance to say no to those new systems, despite the fact that they are both key components of an organizational strategy that targets two crucial business areas: customer reporting and property management.

Homequity handles the residential

Boss rating flies high at Pratt & Whitney

BY CLINTON WILDER
CW STAFF

Supervisors in the information systems department at Pratt & Whitney have to please a tough group of critics: their staffs.

Staff members at the East Hartford, Conn.-based jet engine manufacturer get to evaluate their bosses once per year under the auspices of the 2-year-old Leadership Evaluation and Effectiveness Program (LEEP). Inspired by Vice President of MIS Doug Lewis as a tool to stem employee attrition, the concept has been successful enough to be adopted by other Pratt & Whitney departments — and to be considered by other divisions of its \$22 billion parent, United Technologies Corp.

Lewis said he felt that part of the attrition problem lay with supervisors' employee reviews, which failed to ade-

quately challenge staff members. Lewis wanted an upward evaluation process that would, in effect, challenge supervisors to be more challenging.

"People who work for the supervisor are a better judge of his performance than his boss," Lewis said. "They look at supervisory skills, while bosses look at goals achieved."

Rate your boss

LEEP, designed by a team assembled under Pratt & Whitney's corporate quality program, enables IS employees to rate their supervisors (about 100 people in total) in 18 categories, while also rating the importance of each category to them.

To make the evaluation nonthreatening, the results are not tied to the su-

pervisor's performance review. "I don't want it to be a club over their heads," Lewis said. "But if I consistently scored poorly, I'd begin to question whether I should be a supervisor."

Although influenced by many other factors, including the economic downturn, the attrition rate at Pratt & Whitney's IS department has dropped to almost zero since LEEP was implemented. Lewis and the human resources department are now looking at two years of results to try to form a set of model characteristics for top-notch supervisors.

"Being gung ho and proactive with good communications skills and a very open style — those are the things that seem to pop out," he said.



Lewis was looking for a way to cut down IS turnover

Homequity

FROM PAGE 67

them was the improved performance," Pratt says.

Indeed, analysts on the PC-based system were generating reports five to six times as fast as they did with the centralized Wang system, Pratt says. "Things taking three to four days were now done in half an hour's time," he says.

One big time-saver was the PC-based ad hoc querying tools; another was the fact that the new system was updated daily. The Wang system was updated only once per week, forcing users to recheck all their numbers to make sure they were current.

Business unit managers across the company quickly got wind of the benefits realized by the research analysts, and "the system sold itself pretty much within a month," Pratt says.

"The system is fantastic," says research analyst Patrick D. Moore, who worked on it with Pratt. "People can create their own stuff the way they work. Before, if you wanted information not on a report you had to fill out a form and get on a waiting list, so you'd usually try to talk the client out of" requesting additional information.

A second system that management wants to implement across Homequity's 22 business units was designed to help inventory managers market clients' properties more effectively.

Management began by training inventory managers to collect complete, detailed information about the properties they handle because a lot of that information "just wasn't there," says Joan Zawacki, director of one Homequity business unit.

The training program — definitely not optional — is about halfway completed.

Calcagni recently shepherded the system out of prototype and is now preparing to bring it to those business units that want it.

More work up front

Selling this system to the user population will not be an easy task, however. "The new methodology actually adds work up front," Calcagni says. Not only are users expected to learn a new, systematized way to enter daily reports, they also must learn how to deal with PC packages such as Lotus Development Corp. 1-2-3 and Borland International, Inc.'s Paradox.

Although many inventory managers already have PCs, not all have taken to technology enthusiastically. "We hire people

with people and phone skills, many of whom have a preference for pencil and paper" over keyboards, Calcagni says.

IS paved the way to an easy sales job for the properties marketing system by getting a Homequity business unit involved early on in the development process — in effect creat-

"We are making better decisions quicker, turning properties around faster at less cost," Zawacki says.

Zawacki's unit seems to have done a good sales job on the rest of Homequity. As the time draws near for IS to start implementing the system in real business environments, business units are ac-

UNDER THE OLD way, IS would say to users, 'Here is the new system. You paid for it, use it.' Now we can only say, 'Here's a tool; this is what you'll be buying.' "

STEPHEN PRATT
HOMEQUITY

ing a system "champion" even before the project was finished.

Users in that unit, which is part of Homequity's Eastern region, are now boasting to other units about the benefits they have gained while testing the new system in prototype. The system's in-depth data and ad hoc querying tools have improved inventory managers' ability to turn over properties, Zawacki says. Sales within the unit are 20% higher and costs per client 2% lower than in the rest of the company, she adds.

tually competing to be the first to implement the new system, Calcagni says.

"IS will have to go out and work with each unit to tailor the system, so they'll have to wait their turn," he says.

Granted, not all units have bought into the system: "Some are saying, 'We know how to do our business,' or, 'Not another system,'" Calcagni says.

In particular, those units with seasoned inventory managers may not need the system, at least until those managers leave

the company. "This system doesn't do much for experts, it just brings people up to speed faster" in effective marketing skills, Zawacki says.

Based on the way demand is growing, IS hopes by fall to have user commitments to fund migration in all units from the Wang VS to the new LAN system. "These are tough times and money is tight, but people are already digging for the money to get the system," Calcagni says.

The IS department is also enthusiastic about the user empowerment represented by both new systems. Now that users can, in Pratt's words, "do their own ad hoc querying instead of being spoon-fed by MIS," programmers can spend a lot more time doing their main jobs of systems development.

The new IS/user relationship also fosters more intelligent interaction between the two groups, Pratt says. IS now has a better sense of how the business works, and users can ask questions like "Why do numbers appear this way?" Pratt says.

And how does IS feel about giving away some of its power? "I could feel threatened that a lot of control is going to the user," Calcagni says, "but in fact I'm relieved. A lot of complaints are going away."

Ch



Have you noticed the way networks attract more and more hardware as they change?

It's a bridge box here. A router box there.

A brouter box here.

Costly devils.

Which is why we've built NETBuilder.* It lets you switch from bridging to routing to brouting by changing a single software diskette. The hardware stays the same.

Ch



To simplify matters even more, NETBuilder's bridge, router and brouter have the same menu-driven user interface. So there's a common look and feel. Yet, you can still create custom menus to suit a particular network environment.

As a result, NETBuilder cuts three big expense items in internetworking—new hardware purchases, and the training and servicing to support it.

Yet, you sacrifice nothing for this simplicity.

COMMENTARY

Les Gilliam

Getting the job done right



Many departments and business units are not satisfied with the IS department's services. The complaints heard most often are about high costs and products that are late or incomplete. As a result, some users think that by installing a minicomputer, LAN and/or PCs, they will cut costs and gain control of their computing destinies.

To those departments, senior management should say, "If you think you must become your own IS department, fine. But you will do it right!"

User-based computing is in vogue. With the onslaught of PCs, LANs and minicomputers, IS departments are agreeing, some even voluntarily, to the deployment of distributed or departmental computing in the company.

But are the users doing it right? Have you ever eavesdropped on some of the conversations in these distributed computing groups? The subjects include such topics as unreasonable users, missed deadlines on applications projects, lack of

management understanding and inadequate budgets.

To some of us, these are familiar subjects. I am beginning to wonder if today's departmental and personal computing users are making some of the same old mistakes that the mainframe folks made when they started.

What are some of the painful lessons learned by centralized IS over the last several years? What are some of the areas most often overlooked or left untended in operating an IS function? Here are some of the common elements that should be addressed by users who want to do it right.

• **Informed management.** In the early days of computing, many managers professed ignorance of computing and turned it over to the techies. This abdication of responsibility led to an overemphasis on technology, rather than a business decision approach to the use of computing. The department manager who assumes responsibility for computing must become just as informed about it as he is about any other aspect of the business, if wise business decisions are to be made.

• **De-emphasize technology.** If technology is just a tool that provides increased productivity and enhances profitability, then it must be managed accordingly. Management must be sure employees place more importance on applying the technology than on acquiring the newest or fastest gizmo on the market.

• **Methodology.** If management is to

maintain control and ensure that the staff produces the best business solutions, a methodology is a necessity. Otherwise, each employee will do his own thing, and project management will be, at best, a dart game.

• **Requirements.** Shooting at a moving target can be difficult, but having no target at all guarantees failure. The wise manager will demand a determination of

MANAGEMENT MUST BE SURE employees place more importance on applying the technology than on acquiring the newest or fastest gizmo on the market.

requirements before solutions are proposed and pursued.

• **Justification.** No manager would approve the construction of a new plant or factory without a complete, documented justification based on sound assumptions. But how many computer projects are started with no justification or even a feasibility study?

• **Tools and training.** The more productive computing groups have selected a limited number of tools and have ensured that employees are well trained to use them. Changing software should be done very carefully and only after considering all costs, including the lost produc-

tivity during the learning period.

• **Documentation.** How long is it going to take management to realize the foolishness of creating computer applications without sufficient documentation? No one would dare think of building a plant or an office building without the proper blueprints to guide construction and provide for ongoing maintenance. Yet it is done every day in computing.

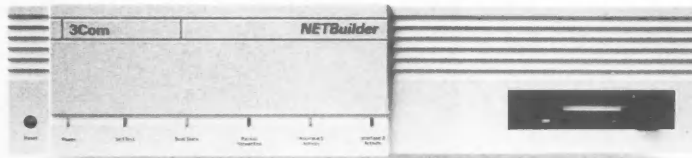
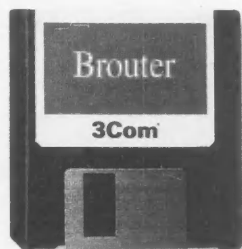
• **Security.** Management has a responsibility to protect and control all company assets under its direction. Yet in many cases, computing tools do not receive the proper attention regarding backup, recovery and the protection of an asset on which the company's business depends. How many departmental computing resources have no documented contingency plan?

• **Acquisition procedures.** The acquisition of computing resources requires careful consideration of product suitability, quality, cost, conversion and vendor dependability. Management must give the same consideration to acquiring computing resources as to any other product on which the company's future relies.

• **Careers.** It is not uncommon to see user departments turning engineers, accountants and even lawyers into computer programmers. Business managers would do well to consider long-range career opportunities for those who become primarily computing employees.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

Ch Changes.



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CALENDAR

MAY 5-11

Microsystems Integration & Workshop Connectivity Conference. Dallas, May 5-7 — Contact: G2 Research, Mountain View, Calif. (415) 964-2400.

ASM Information Systems Conference. Las Vegas, May 5-8 — Contact: Association for Systems Management, Cleveland, Ohio (216) 943-6900.

Semiconductor Forum. Phoenix, May 5-8 — Contact: In-Stat, Scottsdale, Ariz. (602) 860-8515.

Connectivity Day '91. Media, Pa., May 6-7 — Contact: Real World Systems, Glen Mills, Pa. (215) 358-3245.

International Conference on Desktop Manufacturing: The Rapid Prototyping Revolution. Minneapolis, May 6-7 — Contact: CAD/CIM Management Roundtable, Boston, Mass. (617) 232-8080.

Mobile Data Report Conference and Exposition. Cambridge, Mass., May 6-7 — Contact: Waters Information Services, Binghamton, N.Y. (607) 770-8535.

Managing Networks in Times of Change and Uncertainty. Hilton Head, S.C., May 6-8 — Contact: Applied Computing Devices, Terre Haute, Ind. (812) 232-6051.

Super Industry Management Association's International MIS Conference. San Diego, May 6-8 — Contact: Scott Baumrueck, PIMA, Arlington Heights, Ill. (708) 956-0250.

Computer and Management Show for the Design and Construction Industry. Washington, D.C., May 6-10 — Contact: Sharon Price, A/E/C Systems '91, Newington, Conn. (203) 666-6097.

Enabling Work Teams to Reach High Performance. Indianapolis, May 7-8 — Contact: Indiana Labor and Management Council, Indianapolis, Ind. (317) 293-4101.

The Future of World Telecommunications: Corporate Strategy and Public Policy Toward Interconnectivity. New York, May 7-8 — Contact: Julie Terranova, Business Week Executive Programs, New York, N.Y. (212) 512-2184.

Dexpo Spring. Atlanta, May 7-9 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

North America MAP/TOP Users Group Spring Conference. Nashville, May 7-9 — Contact: Steve Sickels, COS, McLean, Va. (708) 883-2704.

National Online Meeting. New York, May 7-9 — Contact: Learned Information, Inc., Medford, N.J. (609) 654-6266.

Today's Software, Tomorrow's Heritage. Bedford, Mass., May 8-9 — Contact: Judy Dayen, Billerica, Mass. (508) 663-6600.

Financial Networks Conference. New York, May 8-10 — Contact: Digital Consulting, Andover, Mass. (508) 470-3870.

Intelligent Mapping. Washington, D.C., May 9 — Contact: Conference Director, Intelligent Mapping, Birmingham, Ala. (205) 980-8297.

MAY 12-18

Nomad International Users Conference. Las Vegas, May 12-16 — Contact: Chris Palomaa, Must Software International, Norwalk, Conn. (203) 845-5000.

The Hammer Sales, Marketing and Service Conference. Boston, May 13-15 — Contact: Hammer & Co., Cambridge, Mass. (617) 354-5555.

Office Systems and Networks Dialogue. Washington, D.C., May 13-15 —

Contact: TTI, Santa Monica, Calif. (213) 394-8305.

Telecom Developers '91. Dallas, May 13-15 — Contact: Teleciti Library, New York, N.Y. (212) 999-0345.

Micro Focus Users Conference. Orlando, Fla., May 13-16 — Contact: Micro Focus Users Conference, Palo Alto, Calif. (415) 856-9817.

Entity Modeling: Techniques and Application. Washington, D.C., May 13-17 — Contact: Bureau Data Systems, Rockville, Md. (301) 762-1288.

Legent Corporation's Users Conference. New Orleans, May 13-17 — Contact: Legent, Pittsburgh, Pa. (412) 323-2600.

Video Expo. Los Angeles, May 13-17 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Data Administration Management

Association Annual Symposium. Gaithersburg, Md., May 14-15 — Contact: Andrea Tyndall Norris, DAMA, Washington, D.C. (202) 453-1790.

Distribution/Computer Expo. Chicago, May 14-15 — Contact: C. S. Report, Exton, Pa. (215) 827-7436.

ID Expo. Chicago, May 14-16 — Contact: Expocon Management Associates, Trumbull, Conn. (203) 374-1411.

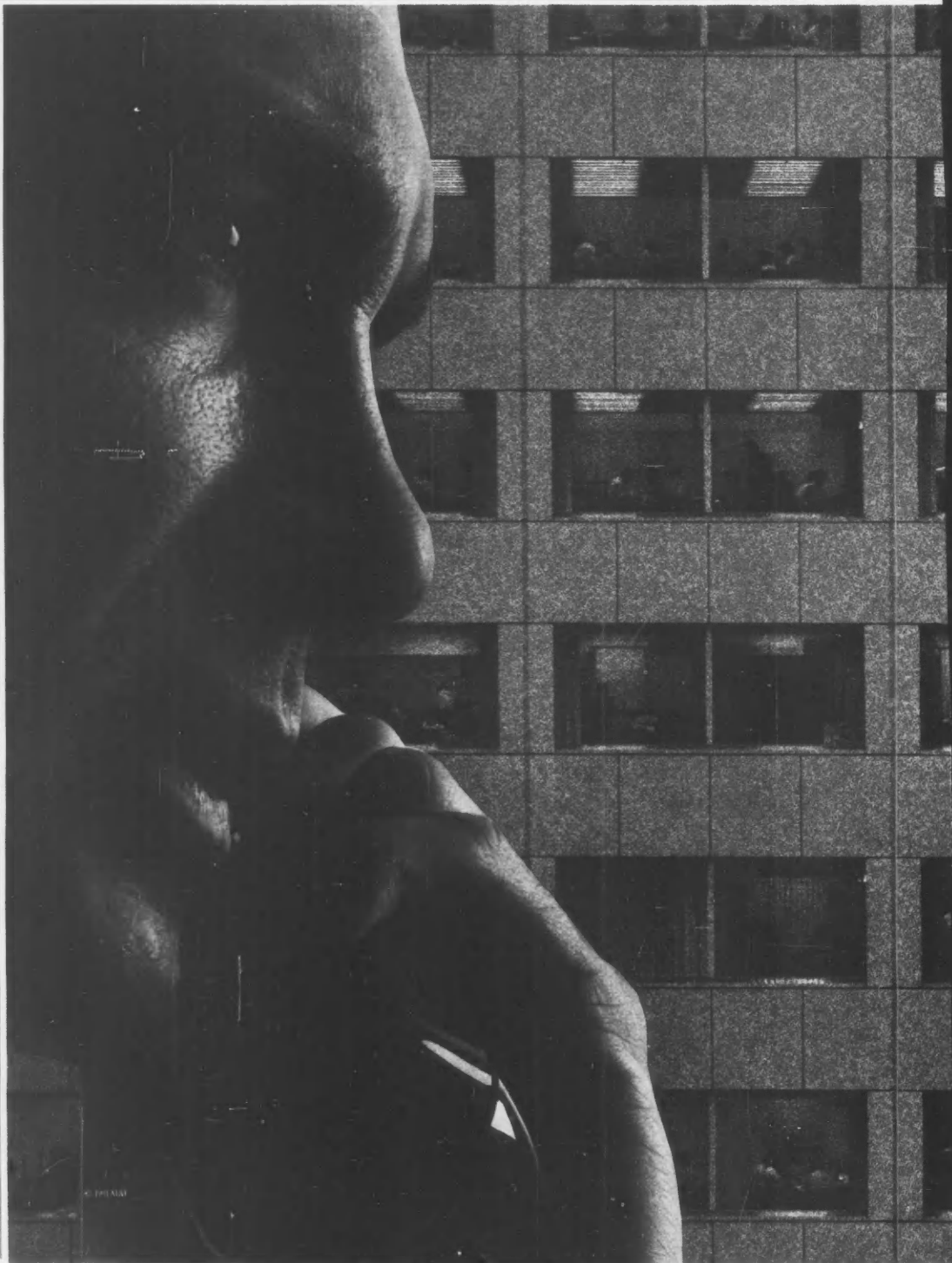
Multimedia Expo. New York, May 14-16 — Contact: American Expositions, New York,

N.Y. (212) 226-4141.

Software Research Quality Week. San Francisco, May 14-17 — Contact: Software Research, San Francisco, Calif. (415) 957-1441.

National Energy Software Center. Argonne, Ill., May 15-16 — Contact: NESC, Argonne, Ill. (708) 972-7250.

Business Continuity Planning Conference. Atlantic City, May 15-17 — Contact: Sungard Planning Solutions, Wayne, Pa. (215) 341-8790.



FDA abandons VDT screen testing

BY J. A. SAVAGE
CW STAFF

Some screens that reduce VDT glare are also touted as reducing electromagnetic fields associated with the monitors, but initial testing by the U.S. Food and Drug Administration indicates

they may not work.

Ed Dawson, acting branch chief for the Television, Acoustic and Microwave Products Branch of the FDA, said preliminary tests — done to gauge whether formal testing is warranted — showed that some devices reduced electric fields, but not

magnetic fields. "While it looks like the products don't do what they say they do, the FDA decided it is not a priority," he said. The FDA will not proceed with formal testing.

The FDA's current testing budget is being used for medical equipment, according to Daw-

son. He said his office proposed formal testing for VDT screens, but there was not enough money available to begin such a program.

Some studies indicate that electromagnetic fields from VDTs and other appliances, such as electric blankets, affect health. The Environmental Protection Agency released a report in December 1990 indicating

there may be some link between cancer and extra low frequency (ELF) electromagnetic fields.

However, a National Institutes of Occupational Safety and Health study released last month said very low frequency electromagnetic fields (in a higher range than ELF) do not affect reproductive health in female VDT workers. Both fields emanate from most VDTs.

"It's clear that nothing you can put on the outside of a computer will reduce magnetic fields," said Louis Slesin, editor of newsletter "VDT News."

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MANAGEMENT BRIEFS

ASM picks officers

Paul R. Saunders will take over as president of the Association for Systems Management June 1. He is president of Saunders Systems Corp. in Nashville.

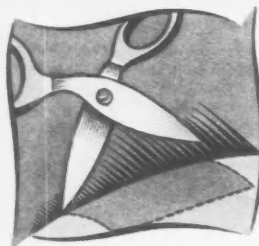
Linda J. Menard-Watt was chosen president-elect and will be president in 1991-92. She is manager of administrative information systems at the University of Windsor in Ontario.

Also taking over new offices June 1 are: as vice president, **William D. Munch**, an information systems consultant in Pleasant Hill, Calif.; as treasurer, **Ross A. Flaherty**, director of information resources at Texas Wesleyan College in Fort Worth, Texas; and as secretary, **Ann M. Purrr**, manager of systems and information processing at Life Office Management Association in Atlanta.

Cause, the association for IS in higher education, has issued a call for papers for its annual conference, scheduled for Dec. 3-6 in Anaheim, Calif. The deadline is May 15. To send a proposal or to receive information, contact Cause at 4840 Pearl East Circle, Suite 302E, Boulder, Colo. 80301 (303) 449-4430.

Roger S. Siboni has been named national director of **KPMG Peat Marwick's** high-technology consulting practice. Siboni, a Peat Marwick partner, succeeds Tom Moser, who has been named managing partner of the firm's North and South Carolina offices.

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Integrating distributed databases into the information architecture"

By Michael D. Krasowski

Journal of Information Systems Management
Spring 1991

■ Senior executives are driving their corporations to be more responsive to changing business needs and customer service, while cutting out levels of management and giving employee work groups total control over work processes.

Information systems managers will need to respond to these trends by ensuring that each work group has local con-

trol of its database, can easily access remote databases and can share data with other groups. Distributed database technology, which enables data to be physically dispersed but logically centralized, can make this happen.

IS managers should evaluate vendors' offerings by checking how well they match E. F. Codd's 12 rules for relational database management systems. The key is to make the distributed database appear nondistributed to the end user.

Even though the technology is immature and vendors offer only some of the ideal functions, investments in distributed database systems are still worthwhile. IS managers will be able to integrate the company's older, stand-alone databases, while building new databases on net-

worked workstations rather than on costly mainframes. — *Mitch Betts*

"It is time for MIS to change the image of fax"

By Ralph D. Loftin

Babson College Center for Information Management Studies
Working Paper Series: 90-03

■ Labor intensity, compromised security, costliness, breakdowns and documents of poor quality are problems associated with fax machines; still, the market is expected to grow through 1994.

Some companies implement additional fax machines to compensate for overburdened ones. Instead, they should incorporate fax into the information systems infrastructure.

IS managers seeking to provide an integrated fax capability have three options:

- Mainframe-attached network servers. Faxes can be sent without printing the document, but all received faxes must be printed and routed manually. This option is suited to some volume applications.
- Individual personal computer fax boards. Limited to single PCs, they will not operate on local-area networks, are not directly programmable and require sophisticated user intervention and dedicated telephone lines.
- LAN servers. The best option, they allow networked PCs to exchange fax messages with fax machines and documents to be sent as electronic mail messages. Combined with a powerful user interface, they let users assemble documents consisting of text, graphics, spreadsheets and images and send them as integrated messages to fax machines or other corporate users.

From the corporate standpoint, LAN-based fax servers can increase user productivity and smooth work flow while cutting costs. — *Jodie Naze*

"Micro Capitalism: Eastern Europe's Computer Future"

By Esther Dyson

Harvard Business Review
January/February 1991

■ The personal computer industry in Central Europe and the Soviet Union is comparable to the U.S. market of 15 years ago — a wealth of potential waiting to be realized.

Successful computer entrepreneurs in those regions have identified market needs of service, distribution and support and have satisfied them.

However, Easterners say it is exploitive to pay for service or distribution of a product; entrepreneurs will be challenged to convince them that there is value in these types of intangibles.

Entrepreneurs will also find distribution channels and establish and sell through authorized dealerships, with the capability of providing support.

The computer market is only beginning to evolve in Eastern Europe and the Soviet Union; many small companies without established reputations lack financial backing. However, Western companies that provide backing may find that by helping to automate small firms and taking advantage of the human capital, they will be rewarded with the fruits of the business. — *Kelly E. Dwyer*

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EXECUTIVE REPORT

THE IS ROLE IN WORK FORCE EDUCATION

End-user training: Needs improvement

But a few standout IS groups are tackling the problem head-on

BY GLENN RIFKIN

At Hills Pet Products, Inc., a major corporate education initiative is under way that originates from an unlikely source: the IS department.

Dan Pitts, vice president of information services at the \$600 million Topeka, Kan.-based pet supply company, wants to educate Hills employees about technology and business issues. He's spending 4% of his information systems budget on training to do it. "The company has held education as a value for quite a while," Pitts says, "and [IS is] at the forefront of that."

That kind of take-charge commitment to education by IS is rare. Training of corporate end users continues to be a conundrum for most companies, consultants say, and most training offerings are either limited, poorly structured or ineffective.

Poor job

Observers blame several factors — ranging from budget pressures, poorly qualified IS trainers and lack of interest — for the poor job done by many IS departments in training end users (see story page 74).

"IS is still bogged down doing the '80s style of support; it's demand-driven and reactive," says Naomi Karten, head of Karten Associates, a Randolph, Mass.-based consulting firm that specializes in IS training. "Not enough of the right training is being provided to end users."

A big part of the problem, says Chuck Winslow, managing partner at Andersen Consulting's Change Management Service, is that IS isn't equipped to train end users about technology.

In most cases, Winslow says, IS lacks skills, such as instructional design and organizational behavior, needed to train end users. Thus, human resources and training departments have taken

up the task, leaving IS the odd man out.

"Companies spend millions of dollars on software development, but training is an afterthought," adds Ruth Clark, an IS training specialist based in Phoenix.

The problem is not lack of spending: Recent estimates place the amount shelled out by U.S. companies on employee training last year at \$45.5 billion.

Nor is interest or awareness lacking. For the first time in *Training* magazine's annual survey, "technological change" topped the list of important challenges. Concern was especially high in business services, education and public administration (see chart page 74).

Similarly, a recent survey of IS executives in large U.S. and Canadian companies conducted by Andersen Consulting found that 87% of those polled considered training and educating the organization's work force "extremely" or "very" important.

"There's an awareness of the need for good training but not a lot being done," Karten says.

Despite the generally bleak picture, many IS groups are finding ways to tackle the end-user education issue. A look at some of the more interesting and suc-

cessful approaches follows:

• **Wide course offerings at Hills.** Pitts spent all of 1990 organizing a broad strategy for end-user training and support. This year, he's implementing that strategy. Both internal and external courses and programs initiated by IS are being offered at Hills to train all levels of end users, from top executives to veterinarians.

The offerings aren't limited to technology. Pitts has even set up a "mini-MBA" course with the University of Kansas to help

IS staff members and end users get a solid grounding in business.

• **Multimedia learning at Steelcase, Inc.** The Grand Rapids, Mich., office equipment manufacturer has opened a multimedia-based learning center called The Learning Curve. In a single year, the number of students trained in a variety of applications increased by more than eightfold at a sharply reduced cost.

The approach has reduced the per-student training cost from \$200 to just \$20, according to Phil Camillo, head of training at Steelcase, the world's largest maker of office furniture.

• **Outsourcing and user liaison programs at TRW, Inc.** Don Logan, TRW's vice president of information resources in Cleveland, decided to seek outside help as a way to handle cutbacks in the central IS staff.

"We moved from managing and controlling training to coordinating the training," Logan

Continued on page 74



Bob Barrett

Pitts (shown with his furry friend, Chump) spends 4% of his IS budget to educate Hills Pet Products' employees about technology and business issues

KEY POINTS

- ▶ A few innovative information systems departments are taking a lead role in teaching technology to end users.
- ▶ Training at many companies remains limited, poorly structured or ineffective.
- ▶ Greater cooperation with human resources and training departments is needed.
- ▶ Computer-based training offers great promise and opportunity for more IS involvement.

Rifkin is a free-lance writer and a former *Computerworld* features editor.

Continued from page 73

explains. "It's easier to get [trainers] outside, and you get superior training for equal or less cost."

TRW also set up a formal end-user liaison program. According to Gwen Callas-Miller, program head and manager of consulting services, the original idea was to get end-user experts in various personal computer applications to serve as ad hoc liaisons to IS.

During the past year, however, IS set out to formalize those relationships. Two categories were set up: technology coordinators (end users who help plan for hardware and software acquisitions) and product facilitators (end users who are experts in specific areas and who teach their colleagues).

"As we cut staff, the concern was how do we take on more with all we have to do?" Callas-Miller recalls. "This program helps solve the problem."

Thus far, company officials say, 50 to 60 end users have joined the program. The biggest

concern now for the program's long-term success is time: How much will it take from the end user/liaison's schedule? Callas-Miller says participation generally requires 5% to 10% of a person's work time.

Who trains these liaisons to be trainers? Either a functional analyst in IS or an outside consultant, Callas-Miller says. According to Logan, the program has been set up in 10 units within corporate headquarters, and if it is successful, it will be expanded to the rest of the company.

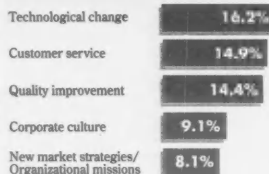
• **Users train users at Rogers Group, Inc.** The Nashville-based mining company runs an information center that handles in-house training for DOS-based word processing, spreadsheets, graphics and other applications.

However, Rogers Group also has 35 field sites between Birmingham, Ala., and Sandusky, Ohio, and must offer training to employees at those locations. The company is downsizing its entire computer operation, moving from a centralized IBM 4381

Everyone agrees: Training is key

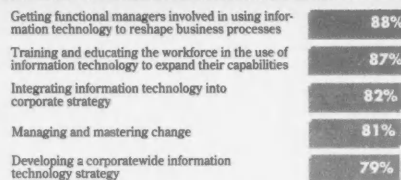
Independent surveys of business executives and IS managers showed that both groups considered technology training a top priority

Business people say technology training is key...



Percent of respondents, partial survey results
Anderson Consulting survey of 2,645 business executives in U.S. companies with over 100 employees

... and IS executives agree



Percent of respondents, multiple responses allowed
Anderson Consulting survey of 125 IS executives in U.S. and Canadian companies with assets over \$500M

CW Chart: Doreen St. John

to decentralized AT&T Unix workstations that will be hooked to a wide-area network.

According to Tom Gmitter, director of information services at Rogers Group, IS is developing courses and training 10 operations people from field sites to serve as trainers for colleagues.

Although field users are expected to continue in their regular jobs, Gmitter says, time conflicts are eased by the seasonal nature of mining.

Gmitter says end users are more responsive to training provided by their colleagues than by someone from IS. "A user has more empathy and awareness of the problems in the field than someone from IS," he says.

• **Federal Reserve Bank of Minneapolis keeps training in-house.** Though end-user groups are free to use outside educators, training manager Mary Texer recommends keeping the process inside.

"Outside training can't be customized to our environment," she explains. "You can't bring a departmental assignment with you to an outside class, for example, so that the exercise is really relevant."

Texer, a professional trainer who oversees training for both IS and the end-user community, finds teachers from within the 140-member IS group. She works closely with her charges to design courses, learn instructional delivery techniques and get classes up and running.

IS personnel seem eager to teach, Texer says, adding that the biggest obstacle is time. While students are given time to attend classes if needed, it's tougher to free up instructors.

• **End-user focus at Twentieth Century-Fox Film Corp.** Not every organization can get trainers from within IS. At Twentieth Century-Fox in Los Angeles, Daniel Bittner, manager of personal computing, finds that outsourcing yields "better training and is more cost-effective."

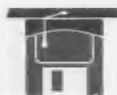
"We're in support mode all the time; we know how to work with and communicate with the end users," Bittner says.

Bittner described various de-

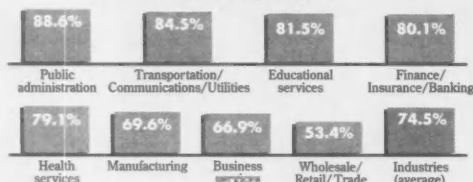
partmental transformations within Twentieth Century-Fox, all of which used outside training for the end users: putting 80 users in the legal department on a local-area network, scanning 50 years' worth of scripts for the story department onto optical disc and installing 33 Apple Computer, Inc. Macintoshes onto a

Teaching the troops technology

Public administration firms are most likely to provide computer training for employees; wholesale and retail firms are least likely



Percent of firms providing each type of training
Total sites surveyed: 2,614



Source: Training magazine survey

CW Chart: Doreen St. John

The trouble with technology training

Why is much of the technology training offered by information systems departments either ineffective or downright lousy? Experienced training consultants give the following reasons:

Style differences. A big gulf remains between the way IS staff members and end users work and think, consultants say. "The buyer is buying one thing, and the CIO is delivering something else," says Chuck Winslow, managing partner at Andersen Consulting's Change Management Service. This gap can render many training programs ineffective or useless, consultants say.

Too-independent users. End-user expertise has become a two-edged sword. While self-sufficiency is good, lack of a broader systems perspective can be a problem for IS as well as for the whole company.

"Many users are solving today's problem by developing applications, but often they don't know what they are getting into," says Naomi Karten, head

of Karten Associates, a Randolph, Mass.-based consulting firm. "When they've exceeded their capabilities, they run to IS." What's needed, Karten says, is a "big systems" mindset, which she says has not yet been delivered by IS.

Karten and others agree that IS must balance the need to instill a broader vision in end users with the recognition that many don't want long, detailed technical explanations and training.

Ill-prepared IS trainers. Another basic problem is that many IS professionals lack the qualifications or background needed to be teachers and instructors. Yet well-meaning instructors continue to be thrown unprepared into classroom training settings, says Ruth Clark, an IS training specialist based in Phoenix. Inevitably, "little or no learning results," she says.

Even when IS professionals are properly trained to teach, they may be perceived as having a poor grasp of user needs. "IS has a reputation as being draco-

nian, of setting up a heavy-handed 'do it our way' kind of training," says Ted Klein, president of consultant firm Boston Systems Group.

Over-reliance on outside trainers. The scores of commercial training providers do a good job designing courses, IS managers say, provided there is heavy input from the organization. The problem, Winslow says, is that outside providers are often "not locked into the issues users have — deep vertical issues about the business they are in."

Budget pressures. The current gloomy economy hasn't helped end-user training, consultants say. In a poor economy, training programs are often the first budget items to go.

Backward thinking. IS rarely designs training into a system, which is a mistake, according to Winslow.

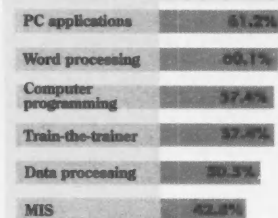
"Training should be brought up at design time, not right before conversion," he says. •

GLENN RIFKIN

Basic training

While more than 60% of large firms offer basic personal computer training, far fewer offer more advanced computer skills. Most use a mix of in-house and external trainers

Percent of firms providing each type of training



(Base of 2,645 organizations with 100 or more employees)

Source: Training magazine survey CW Chart: Doreen St. John

network for the feature production department.

"I'm concerned about the quality of the training, but we keep a close eye on the courses and work closely with the training supervisors," Bittner explains. "We make sure we get what we want." •

Training the trainers

According to Tom Gmitter, director of information services at Rogers Group, Inc., a Nashville-based mining company, there are three keys to making a "train the trainer" program work:

1) IS must know where to add value to the end user by understanding what is important to the business.

2) IS must know its customers. "You have to walk in their shoes: Find training that really fits their needs," Gmitter says.

3) IS must realize that training is not rocket science. "It's a cop-out when an IS manager says he doesn't have people inside who can handle training," Gmitter says. "If you don't find the people, you have to develop them."

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**"A DSU THAT
ADAPTS TO MY NEEDS?
THAT'S A FIRST."**

Chase lets computers do the teaching

BY MARK FRITZ

Computer-based training (CBT) is the next best thing to being there — or in some cases, better than being there, say information systems officials at The Chase Manhattan Bank NA.

While training end users occupies more and more of IS departments' time these days, smart organizations are exploiting new technologies to keep their own rank and file technologically well-educated.

Pat Coglianese, bank vice president and manager of IS training at New York-based Chase Manhattan, says a new CBT system for the bank's data center managers has helped improve staff mobility and efficiency by giving worldwide employees a common base of knowledge.

Coglianese says CBT was the only viable solution for the project, which began early last year. Her task was to develop a training program for about 500 data center managers at 60 locations

worldwide. The managers needed some standardized guidelines to follow for tasks such as customer service, change management and handling emergency situations.

The decision to use CBT was clear-cut, although Coglianese says Chase Manhattan doesn't

have sites. And the idea of teleconferencing was nixed by the time zone differences between the various offices. CBT was the only answer. "For us, it was an option of training by CBT or no training at all," Coglianese says.

Even so, Coglianese faced some big challenges. A major one was devising a program that would work on the bank's diverse systems. "We had to go with the lowest common denominator in terms of hardware," Coglianese says.

This meant she couldn't draw on her team's creativity to produce appealing, eye-catching graphics; she had to limit the course to graphics simple enough to work with IBM Color Graphics Adapter (CGA). "That's hard," she says. "How do you keep it interesting?"

That problem affected even minor details of the project, such as choice of screen colors, according to Coglianese. "Sky blue in CGA isn't necessarily sky blue in VGA," she says.

Coglianese also notes that setting up CBT takes a lot of planning. "You really have to scope out the problems in ad-

vance," she says. "The entire design had to be done on paper first. We wanted to make sure there wouldn't be last-minute changes that would require us to recode the whole course."

Completed last June after about six months of work, the course was created using the Sam authoring system from Technology Applications Group in Troy, Mich. The course consisted of two modules covering four general topic areas: administration, customer service, quality and operations.

Called "The 39 Elements of Data Center Management," the course fit on one high-density

disk and was shipped to Chase Manhattan data centers around the world.

"Supervisors will be able to move internal staff around more easily and deal more effectively with turnover problems," Coglianese says. Indeed, trainees' initial reaction to the course has been so positive, she reports, that work is already under way to add a new local-area network management module.

It's still too early, however, to evaluate the course's ultimate effectiveness, Coglianese says. "The course teaches data center managers what to do, not how to do it," she explains. "We can ask them whether they have their plans in place, but how and when they implement those plans is up to them." ■

Close-up
Organization: The Chase Manhattan Bank NA.
Problem: Train 500 data center managers at 60 locations worldwide.
Solution: Develop computer-based training and distribute to all locations.
Benefits: Improved staff efficiency and mobility.

use the technology widely because "it's often difficult to justify the high up-front cost."

In this case, however, more traditional options were simply not feasible. Bringing all the data center managers to New York for training would have cost too much money and time. Ditto for sending instructors to the vari-

If CBT fits, use it

Experts say you should use computer-based training when:

- You're training a lot of people at different levels.
- The trainees are geographically dispersed.
- The cost to develop CBT is less than the cost of using human trainers.
- Trainees are reluctant or unable to attend classes.
- Trainees need to learn at their own convenience.

Expanded training role crucial for IS groups

INSIDE EDGE

BY JACK E. BOWSHER AND NANCY S. MENGEL

The leading organizations of the 21st century will be distinguished by their ability to blend superior technology with a talented work force. Attaining a top competitive position will demand that information systems groups take a new, greatly expanded role in work force education.

Specifically, IS staffs must:

• **Exploit training technology.** Many of the skills-building and management development courses now held in corporate classrooms can be delivered through personal computers and interactive videodiscs.

Working with the company's instructional designers, the qualified IS professional can help develop software to provide computer-based training (CBT). Technology should be embraced as a training delivery mechanism to ensure that education is delivered in the most timely, effective and economic way — on demand

at point of need.

Many IS department heads already recognize the role their staffs must play in designing and explaining applications that will tangibly improve an employee's ability and performance.

In a recent Andersen Consult-

ing study, 79% of IS executives surveyed said the need to educate the work force in the effective use of applications is one of the most critical issues in the 1990s.

Smart IS managers will also realize that success ultimately depends less on the technical skills of the IS staff than on the ability of IS to educate users.

• **Build "sociotechnical teams."** IS must develop close working relationships with line managers and the company's human resources and training functions. Technical teams must become part of broader sociotechnical teams whose efforts are focused on building the architecture for a re-engineered, customer-driven, highly competitive organization.

IS partnership with other functions must begin before new technology is created. Starting with software design, the IS staff should work closely with the appropriate operations head and his staff. The only way to create technology that improves an employee's performance is to understand the tasks involved in the particular job.

The software should be designed with commands and features that accurately reflect the worker's — not the developer's — computer background and operational expertise.

To maximize the effectiveness of both the worker and the technology, the team of IS and operations managers needs to fully assess the impact of the new technology on the user and

on the department's functions. Members of the team need to determine whether workers' jobs can be simplified via technology to improve productivity and the quality of work.

• **Join forces with trainers.** Historically, IS development staffs and education planning departments have operated independently. Only after systems were designed did the issue of employee education arise. The result was systems that rarely spoke the workers' language.

Training was provided haphazardly, if at all.

As training is planned, the IS staff should be prepared to help the education department communicate not only the commands of the new system but also, more importantly, the tangible advantages the technology delivers.

• **Offer "just-in-time" training.** Taking the educational uses of technology one step further, the IS staff should help develop "just-in-time" training programs. This type of instant access support is becoming critical in today's environment, which fosters rapid changes in job responsibilities and places a premium on quality service and doing things right the first time.

For example, a reservations clerk who seldom performs a given task can tap into on-line instructions that would guide him through the task without keeping the customer waiting.

A pharmaceutical salesperson can check a product's price and availability to quote an accurate cost and delivery date to the buyer. Also, using multimedia hardware and technology, an aircraft mechanic can call up instructions for replacing a certain part and can view a video showing the process step by step.

Through partnerships with corporate training department and human resources staffs and by focusing on the end user, the IS organization can make a critical contribution toward helping the company use technology not only to compute but also to compete in the years ahead. ■



"TECHNOLOGY SHOULD be embraced as a training delivery mechanism to ensure that education is delivered in the most timely, effective and economic way — on demand at point of need."

Jack E. Bowsher
Consultant



"SMART INFORMATION systems managers will also realize that success will ultimately depend less on the technical skills of the IS staff than on the ability of IS to educate users."

Nancy S. Mengel
Associate Partner
Andersen Consulting

Bowsher, author of *Educating America: Lessons Learned in the Nation's Corporations*, is a consultant to Andersen Consulting. Mengel heads Andersen's Change Management Services practice in the Hartford, Conn., office.

Measure for measure

Measurement is shifting from metrics that focus on IS output to those that focus on the business outcomes of IS actions

BY HOWARD RUBIN

The awareness of and need for information systems measurement is reaching a feverish level, yet the mortality rate for most measurement programs is about 80%. These failures can be traced to betting the whole program on a single metric and then trying to figure out what to do with it.

IS input — investments in tools, techniques, people, environment, architecture, the workplace — has no meaning unless it is connected to business outcomes — improved quality, shorter cycle times, increased shareholder value, enhanced customer satisfaction and so on.

Good metrics answer the question: What is the value of (add here any technology you like) to the business? Effective measurement programs take concerns in both IS and the business as their basis.

To evolve to business-oriented measurement, an organization typically goes through three stages of measurement evolution:

■ **Stage 1: Internal IS measurement.** At this stage, IS organizations focus on designing a meaningful measurement program from a technical vantage point. IS develops operational definitions for IS performance at the organizational, application and project level. In this way, it can define key measures for assessing its technical and software processes in terms of quality, productivity and impact on customer satisfaction.

Typical measures at this stage include productivity-oriented I/O ratios (such as function points per team-month), defect and/or failure densities and intensities, software process maturity ratings and technical quality.

■ **Stage 2: Linking to the business.** At this point, the IS organization focuses on

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Joni Levy Liberman

linking these key technical indicators to business performance.

For example, the IS organization should be able to make assertions about its performance in business terms: "If we show a productivity increase of N% this year, the business will be able to lower product costs by Y% or produce Z new products and revamp M old products."

A shift in measurement occurs at this stage, going from output/input to outcome/input. Typical measures include functional quality and those metrics used in Stage 1.

■ **Stage 3: Business-oriented measurement.** At this stage, the IS organization can directly express changes in its performance. The measurement focus shifts to outcome — business value, cycle time, quality, profitability, shareholder value, process improvement and yield.

Measurement dashboard

What kinds of measures should a company implement throughout these three stages? IS can set up a measurement program (see story page 79) based on 10 metric categories that provide a reasonable universe for measuring an IS organization, its projects and its

applications. Each category is a gauge that shows current performance, baselines, directional trends and target improvement areas.

These 10 gauges form a "dashboard" from which a company can gather all the information it needs to measure the IS organization. The IS department can select from these 10 the individual metrics appropriate for what it is trying to measure.

Just as a car's gauges can range from simple colored lights to detailed gauges calibrating units of temperature for water, oil and other factors, these dashboard gauges can vary in the level of detail they track and amount of information they convey.

For example, an IS director may want a general gauge to view organizational performance at the product or application level, while a project manager might need a cluster of detailed gauges for assessing internal project performance at the process level.

In the following list, gauges 1 through 9 are the more technical metrics typically used during Stage 1 of a company's measurement evolution. Gauge 10 takes a company through Stages 2 and 3:

1) **Productivity metrics.** These measure the software delivery rate and ability to support software.

2) **Quality metrics.** These measure the technical quality of the software produced and maintained, the software's functional quality in the context of meeting business needs and the quality of the software engineering process as practiced by IS.

3) **Delivery metrics.** These measure the organization's ability to meet time and cost commitments.

4) **Penetration metrics.** These measure the extent to which tools and techniques have been successfully disseminated.

5) **Work profile metrics.** These measure the effort and elapsed time it takes for work to progress through life cycle stages.

6) **Demand metrics.** These measure request backlogs and the IS organization's ability to service them.

Continued on page 78

Generations of metrics



CW Chart: Marie Haines

Continued from page 77

7) **Technology assimilation metrics.** These measure the organization's ability to adopt and assimilate promising new software engineering technology.

8) **Work distribution metrics.** These measure the balance between maintenance and development.

9) **Capability metrics.** These measure the ability of the IS organization to manage, measure and improve itself.

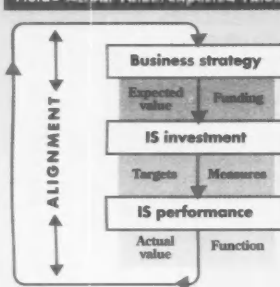
10) **Business-oriented metrics.** These link IS functions to the success measures used by the business to gauge business performance.

All of this good stuff sets the stage for a shift from the current output/input view of IS measurement to a more meaningful outcome/input view.

Business value framework for a money center bank

The main driver of IS investment is increasing the actual value IS delivers to the business.

Yield = Actual value/Expected value



Source: Howard Rubin Associates, Inc.
CW Chart: Doreen St. John

Business measurement

To measure IS in business terms, companies need to build a business value framework for figuring out what IS yields. Yield is the actual value delivered to the business vs. what the business expected the benefits to be. Increasing the yield of IS to the business is the main driver of IS investment in an organization.

Yield is calculated using the following equation: $\text{Yield} = f(\text{delivered value}/\text{expected value} \times \text{customer satisfaction})$. This equation translates into "yield is a function of the ratio of delivered value to expected value weighted by customer satisfaction (0% to 100%)."

That's how it looks; here's how it works: At the start, the customer specifies the project's business value in quantifiable terms (expected value). At the end of the project, the customer states the value as delivered (actual value). Yield is this ratio of actual value to estimated value.

However, yield must be adjusted for customer satisfaction, which ranges from 0% to 100%. Therefore, while a delivered product can be almost exactly what the customer requested (0.9), if the customer was only 50% satisfied with the process that created the product, yield is $0.9 \times 50\%$, which equals 0.45.

A money center bank, for example, wanted to assess IS contribution to its business — in other words, its IS yield. It set up a framework that showed the relationship between business strategy, IS investment and IS performance (see chart above). Using the framework provided the bank with a clear path to implementing business-oriented measurement.

The bank's framework indicated multi-

ple aspects of IS alignment at the institution. There is alignment between the business strategy and IS investments in projects and infrastructure, alignment between IS investments and actual IS performance and alignment between IS performance and the business strategy. Alignment can be measured thusly: $\text{alignment} = f(\text{strategy, capacity, capability, technical performance})$.

IS performance has three other measurable components besides alignment: capability, capacity and technical performance. These key indicators can be measured as follows:

• IS capability = $f(\text{process maturity, skills, tools, technology, tool use, knowledge})$.

• IS capacity = $f(\text{productivity, staff availability, backlog of old work})$.

• IS technical performance = $f(\text{productivity, quality, cost of quality, meeting commitments})$.

The point here is that alignment, capability, capacity and technical performance are dependent on a number of functions IS can measure. These key indicators are so intertwined, however, that even if an organization is an exemplar of technical performance and has outstanding capability and ample capacity, it will not contribute any business value unless it is aligned to the business. Alignment channels IS energy into useful work.

Create indexes

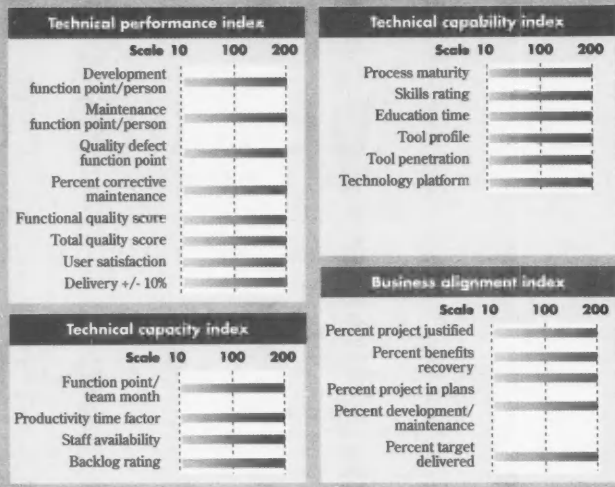
To make these abstract "equations" real, they can be turned into indexes (see chart at right): technical performance index, technical capability index, technical capacity index and business alignment index. These are analogous to a consumer price index or market basket and contain those items that should be measured.

The scales work this way: For each index component, the 100 point represents the 1980 industry benchmark. A 10-point movement to the right or left of this point indicates one standard deviation from the 1980 value. Numbers above 100 indicate high performance; numbers below 100 indicate low performance.

While the indexes shown indicate in-

Indexes of measurable components of IS performance

By plotting your firm's numbers on these graphs, you can see if you're getting high performance (above 100) or low performance (below 100) from IS



Source: Howard Rubin Associates, Inc.

CW Chart: Doreen St. John

dustry performance, an individual company can use them to start tracking its rate of improvement.

Viewing these indexes together creates a first approximation framework for assessing the value of IS to the business: $\text{Business value} = f(\text{alignment, capability, capacity, performance})$.

Roughly translated, this measure means the business value of computing is a function of being able to channel performance, capability and capacity into the right work categories through proper alignment. The interpretation of the indexes is that superior performance, capability, capacity and alignment translate into high business value for IS.

True productivity can then be measured as the change in business value resulting from an investment that impacts alignment, capability, capacity and technical performance.

This framework forces a realistic connection between IS actions and business outcomes. It also provides a basis for adding value to many of the measures being used today by establishing the links between the five key business indicators: technical performance, capability, capacity, alignment and business value.

Finally, it provides a context for IS investment analysis and assessment of the impact of investments on each indicator.

The companies that will win the competitive battles of the 1990s and beyond are those that leverage their technology investments to create new possibilities and major changes in the economics of doing business.

The IS mission is (and will continue to be) to provide increasing value to the business. Business-oriented measurement is the entry point for those ready to take on the challenge. •

A tale of two companies

Bank and insurance firm give business value concept a whirl to redesign IS

Recently, two major New York financial institutions — a money center bank and a large insurance company — used business value measurement concepts to drive the redesign of key components of their IS groups.

At the bank, senior management was concerned about the cost associated with its human resources administration systems group. A business-oriented measurement analysis revealed that the supported administrative systems provided value to the enterprise by lowering staff support costs and improving overall staff retention as well as by providing flexible benefits packages.

This analysis led to a technical measurement-based assessment of systems support productivity and quality. Metrics used included function points supported per person, lines of code supported per person, maintenance and enhancement cost per production cost, technical quality and defect density.

Recommendations focused on increasing business value and further streamlining support costs and fell into three categories: technology infrastructure improvements, modifications to the work priority process and business process redesign.

The result was a decrease in the systems budget from \$4 million to \$2 million through the introduction of new tools, techniques and work practices. Furthermore, support personnel was reduced 50%. IS staff was reallocated to work in business units, the work flow between IS and the business unit was re-ordered and effective end-user computing was introduced.

The insurance company was plagued by maintenance overload. More than 200 IS professionals were tied up in rudimentary maintenance tasks, while the organization was in need of an additional 60 staff members for new strategic development activities.

Here, too, the company took a busi-

ness value measurement approach. The company applied a business value analysis to the maintenance request cycle.

These measures yielded an amazing insight. Fifty percent of the maintenance requests being executed had no business value. In addition, a technical measurement analysis revealed that support ratios were only about one-third of industry benchmarks.

As a result of this analysis, the firm put in place a process in which IS acted only on maintenance requests with clear business value. The insurance firm further introduced new maintenance support tools to help bring support loads up to industry standards.

The result? Seventy-five IS people were freed up for new development, 100 were assigned to maintenance, and 25 were assigned to a maintenance "surge" pool to rebuild the application base while being "bid out" to work on large maintenance projects.

HOWARD RUBIN

The metrics behind the dashboard

BY HOWARD RUBIN

When choosing from the 10 possible gauges to form your metrics dashboard, it is important to know the specific types of measures that fall into each category:

1) Productivity metrics. Typically expressed as ratios of size to time. Ratios of size/total effort allow productivity to be assessed per hour, per man-month and so on. Ratios of size/team-months provide a basis for assessing cycle time productivity. Common size metrics in use today include:

- **Function points.** A score derived by counting system inputs, outputs, files, interfaces and inquiries, weighting them for complexity and adjusting based on system characteristics.
- **MK-II function points.** Based on counting input/process/output transactions and then applying a scoring scheme similar to that of function points.
- **Bang.** Based on counts of functional primitives in a system specification.
- **NCSS (Non-Commented Source Statement), DSI (Delivered Source Instructions) and KLOC (Thousands of Lines of Code).** Sizing measures based on actual code size.
- **Volume.** Based on software science techniques that consider code and the operators and operands present.

2) Quality metrics. Cover a range of quality attributes from measuring defects to design/code complexity to customer satisfaction:

- **Defect.** Defined as a deviation between desired and observed results. Measurement is typically expressed as a ratio of defect/size.
- **Failure.** Defined as a departure of program operation from user requirements. Measurement is typically expressed as failure "intensity" — failure/time period.
- **Fault.** Defined as a defect in a program that causes a failure. Measurement is expressed as fault/size.
- **Technical quality.** Composite metric derived by a combination of subjective and objective measures relating to design strength, maintainability and operational performance (such as failures). Scored on a 0-to-100 scale.
- **Functional quality.** Composite metric that rates an application from a customer's viewpoint — its reliability, accuracy and integrity. Scored on a scale of 0 to 100 and weighted for user perception of importance.
- **Customer satisfaction.** Composite metric that relates to product, development process, customer/developer relationship and service delivery. Most companies develop their own metrics.
- **Complexity metrics.** Used as a surrogate for quality. Works on the basis that the higher the complexity rating of the software, the more prone to errors and difficult to maintain it is. Metrics include McCabe Complexity.

3) Delivery metrics. Track "actuals" and "estimates" at the project completion level and subproject level (deliverables phase). Typically, companies try to determine: "What percent of projects are delivered to the customer within +/- 10% of estimated time and cost and at an acceptable level of customer satisfaction?"

4) Penetration metrics. Evaluate the actual end use of a company's entire suite of tools and techniques. Computed for individual tool or technique (such as front-end computer-aided software engineering) as a ratio of "number of professionals applying CASE in the intended manner at the intended time" vs. "total number of professionals that should be applying it." Some companies have extended this metric by tracking the number of professionals knowledgeable in a particular tool or technique vs. those actually using it effectively.

5) Work profile metrics. Track the amount of effort and time an organization spends as it moves through a project life cycle. By analyzing the work breakdown as a percentage of total time and effort, an organization can get a profile of where it is spending its time. When used with other metrics, it can pinpoint identity deficiencies in analysis, coding or testing.

6) Demand metrics. Focus on tracking the backlog of work generated for the IS organization by the business, the size of the backlog in effort and dollars and the type of work within the backlog.

7) Technology assimilation metrics. A multidimensional rating of an organization's ability to recognize and assimilate appropriate technology into the systems process. Results in a visual "footprint" assessment of the skills inventory, educational inventory, culture, motivation, willingness to invest, technology platform, support for innovation and work focus.

8) Work distribution metrics. Consider the balance between maintenance and new development in terms of spending, effort and personnel allocation.

9) Capability metrics. Based on the use of a Software Process Maturity Scale. An organization is rated/certified at one of five levels of process maturity: initial, repeatable, defined, managed or optimizing.

10) Business-oriented metrics. New class of metrics. Basic measures involve the computation of "yield" measures such as actual vs. expected benefits and "impact" measures that relate change in IS performance and cost structure to business-critical performance indicators such as profitability, cycle time and product quality.

Inch into measurement

Steps for organizations beginning measurement program

An organization getting started in measurement should follow these basic steps, which form the requirements gathering and design process for ensuring measurement success:

- Identify all audiences for measurement and measurement stakeholders. An audience is an individual or group that will be using measurement for decision-making. A stakeholder is an audience that must buy in to make the measurement program work.
- Analyze the measurement needs of each audience and stakeholder. Determine how they would assess productivity and quality improvement — do they focus on a business or technical perspective or both?
- Produce a map that cross-references audiences to needs (see chart below).
- Produce a map that cross-references needs to possible metrics (see chart below).
- Decide which candidate metrics to use.
- Establish priorities and a phased implementation plan.

You may want to consider using a joint application development approach for mapping and a rapid prototyping approach for validating the chosen metrics and their use.

HOWARD RUBIN

Matching audience to need

Audience feedback focuses on customer satisfaction as well as IS effectiveness and efficiency

Desired feedback	Audiences and stakeholders						
	President	Senior vice presidents and business officers	Senior vice president of IS	Vice president of IS	Assistant vice president of IS	System managers or IS	Project managers and system leaders of IS
• Responsiveness to user needs	X	X		X	X		
• Time and cost to deliver service	X		X	X	X	X	X
• More user participation			X	X	X	X	X
• Staff capability	X	X					
• Right infrastructure investments	X		X	X	X		
• Alignment with the business	X	X	X	X	X		
• Quality of the asset				X	X	X	
• Lower support costs and better operations	X	X					

• Purposes most related to customer satisfaction

• Purposes most related to IS effectiveness and efficiency

Matching audience need to possible metrics

Metrics cover user, IS staff and technical areas

Metric measurement approach	Feedback						
	Responsiveness to user needs	Time and cost to deliver service	More user participation	Staff capability	Right infrastructure investments	Alignment with the business	Quality of the asset
• Functional quality	X						
• Systems performance							
• Function points		X					X
• Lines of code		X					X
• Benefits audits	X				X		
• Service request tracking	X				X		
• Actual project effort and schedule	X	X					X
• Planned project schedule and effort							
• Computer resource accounting							
• User satisfaction survey	X		X	X		X	X
• Technical quality						X	
• Application code quality						X	
• Defect tracking			X			X	X
• Applications portfolio demographics							X
• Staff time accounting	X						X
• Staff skills inventory			X				
• IS staff database							
• Tool penetration				X			
• Applications spending levels					X		
• Level of rescue maintenance						X	X

• Metrics most related to customer satisfaction

• Metrics most related to applications effectiveness and efficiency

Source: Howard Rubin Associates, Inc.

CW Chart: Marie Haines

Right.

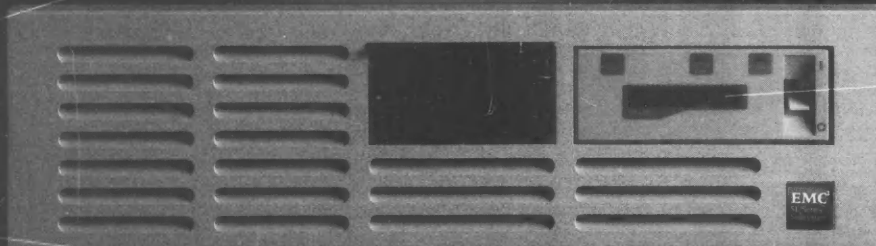
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COMPUTER INDUSTRY

NATIONAL BRIEFS

Many happy returns

► Computer industry pioneer John Cullinane, founder and several-time head of the former Cullinet Software, Inc. (now a part of Computer Associates International, Inc.), is back from a year's fellowship at Harvard's Kennedy School of Government and ready to resume his place as an outspoken industry executive. In this incarnation, Cullinane appears as head of **The Cullinane Group, Inc.**, a consulting firm based in Westboro, Mass. Already afoot is a plan to hatch a joint venture with neighboring **Sentry Publishing: the Coalition for Information Technology Executives**, a subscription service intended to bring chief information officers closer to the boardroom by giving them videos, seminars, books, research and an annual conference.

Soldiers of Fortune 500

► *Fortune* magazine's list of the 500 largest industrial corporations in the U.S. is out, and this year's ranking packs a surprise in the computer category: while IBM still reigns supreme (first among computer firms, fourth on the list at large), **Digital Equipment Corp.** was edged out of the number two spot by **Hewlett-Packard Co.**; this time, HP weighs in at number 29, DEC at 30. Rounding out the computer industry's top five are **Unisys Corp.** (49), **NCR Corp.** (79) and **Apple Computer, Inc.** (95).

'IBM compatibles' step out of the clone zone

BY RICHARD PASTORE
CW STAFF

Even as you read it here, the term IBM-compatible may be becoming a misnomer. Clone vendors seem less eager to follow IBM's technological lead than they did as recently as one year ago. The compatible makers pride themselves on their differentiation, although their departure from the IBM mold may owe as much to IBM as did their former adherence.

Last week's Advanced Computing Environment announcement is the latest case in point. Rather than copying IBM's pro-

prietary RISC System/6000 reduced instruction set computing (RISC) architecture, compatible makers are forging their own RISC path. Compaq Computer Corp. has been joined by other personal computer cloners Acer America, Inc. and NEC Technologies, Inc. to define its own RISC standard based on Mips Computer Systems, Inc.'s processors.

"If I just copied IBM's hardware, then I could be no better than IBM. That wasn't our intent at all," said Gary Stimac, senior vice president of systems engineering at Compaq. One of the first compatible systems vendors, Compaq has built a pre-



Advanced Logic Research, Inc.

Headquarters: Irvine, Calif.
Founded: 1984
Employees: 550
Sales: \$172 million
Net income: \$11.5 million

AST Research, Inc.

Headquarters: Irvine, Calif.
Founded: 1980
Employees: 2,300
Sales: \$586.5 million
Net income: \$52.5 million

Not just cloning around

IBM compatibles makers, once content to follow IBM's lead, may be moving into leadership positions of their own

Compaq Computer Corp.

Headquarters: Houston
Founded: 1982
Employees: 10,000
Sales: \$3.6 billion
Net income: \$455 million

Wyse Technology

Headquarters: San Jose, Calif.
Founded: 1981
Employees: 2,000
Sales: \$450 million
Net income: Not available

mium-priced reputation for designing systems that consistently outmuscle comparable IBM

boxes. It has also forged its own lead in the portable computer

Continued on page 85

Wang climbs on consulting bandwagon

BY PATRICIA KEEFE
CW STAFF

LOWELL, Mass. — It is a couple of years late, but last month, Wang Laboratories, Inc. played catch-up by rolling out a consulting services group designed in part to move the firm closer to what remains of its customer base.

The Professional Services Group will be responsible for coordinating the company's worldwide presales support, consulting services and customer training.

Wang Chairman and Chief Executive Officer Richard Miller said the organization was created to help customers maximize

their computing investments and to achieve improvements in productivity and quality.

Several analysts were quick to point out that before that can happen, Wang will have to overcome its longtime reputation for shoddy service.

WANG

Heading up the Professional Services Group will be William T. Wilde as vice president of professional services. He reports to William P. Ferry, senior vice president of applications and professional services.

Wilde was previously responsible for business development and customer enterprisewide integration projects at Digital Equipment Corp.

George Colony, president of Forrester Research, Inc., said he is skeptical of the overall trend toward vendor-run consulting arms. "It's still not proven that a vendor can make money in the consulting business," he said. "Users tend to be quite suspicious when a vendor says, 'Consulting costs \$100 an hour, but if you buy the systems from us, we'll [consult] for free.'"

He ticked off three reasons behind the launch of the Professional Services Group:

- To compete with consulting

arms of competitors such as IBM and DEC. Because of declining hardware margins, Wang "really needs to look to service to improve their margins," said Julie Schwartz, assistant director of professional services at LedgeWay/Dataquest.

• To put together a group of people capable of building business processes, "which involves helping users figure out how information flows and then, of course, providing the systems to help with that," Colony said.

• To get closer to the user. According to Judith Hurwitz, editor of Patricia Seybold's "Unix in the Office" newsletter, Wang has already been providing consulting services through individual business groups. A single unit, however, could be more effective and cost-efficient.

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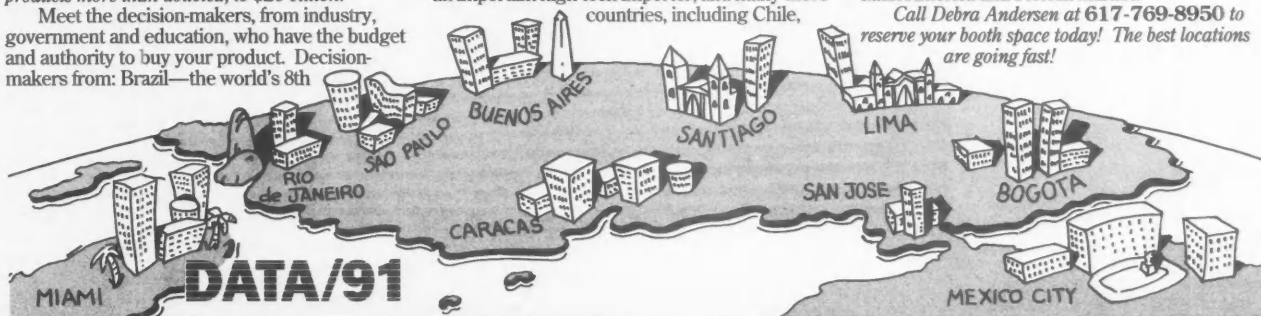
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INTERNATIONAL
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Where's it at?

► **First, Ashton-Tate Corp.** expanded the company with the purchase of long-term ally **Interbase Corp.** (CW, April 8); now Ashton-Tate is expanding its turf. Early this month, the Torrance, Calif.-based database software vendor opened doors at its Tuas, Singapore-based Asia Manufacturing Centre, created both to turn out products and to serve as a distribution hub for the firm's international division. The new facility, now fully operational with a 70-person employee roster, joins Ashton-Tate manufacturing plants in Puerto Rico and Ireland.

April in Paris

► The European Commission said it is likely to launch an investigation into the French government's plans to pump more than \$1 billion into French electronics giant **Thomson SA** and computer maker **Groupe Bull**. According to a commission spokesman, it would be normal practice to check whether the support constituted a legitimate commercial investment as opposed to unfair state aid in disguise, once Paris normalizes its plans in June. The investment plan could reopen wounds from past clashes between Paris and Brussels over the right to spend money on state-owned firms.

Israel aims at \$1 billion

► Israel's information technology market is expected to reach \$923 million this year and top the billion-dollar mark in 1992, according to a research report issued by Israeli firm **Kasselman Management Services Ltd.** In 1990, Israel's information technology market totaled \$840 million. According to the report, the 1991 market will break down into \$393 million in systems sales, \$375 million in services, \$85 million in equipment and \$70 million in maintenance.

Stretching a yen

► **IBM Japan** has announced a sales hike of 1.1% and a net income decline of 18.8% in the fiscal year ended December 1990. In making the announcement, the company cited a series of adverse factors, including a sluggish worldwide economic environment and rising Japanese interest rates.

Alcatel dialing up lots of francs

► French telecommunications company **Alcatel** announced that its 1990 net profit climbed 24% to \$749 million, from \$506 million in 1989. Revenue inched up 5% to \$17 billion, according to a report in the European financial press. Operating profit in public network systems jumped 58% to \$800 million, boosted partly by switch sales to former East Germany and sales of Alcatel's System 12 exchanges to Australia, the report said.

Meet the new boss

► **Hitachi Ltd.** named a successor last week to current president **Katsushige Mita**, who will be promoted to chairman of the Tokyo-based firm. Effective following Hitachi's June 27 board meeting, Executive Vice President **Tsutomu Kanai** will step up into the presidency.

ICL: Two out of five ain't bad

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — The Management Board of the Joint European Submicron Silicon Initiative (JESSI), the European semiconductor research project, decided last week to allow Japanese-owned computer vendor **International Computers Ltd.** (ICL) further participation in two programs in the computer-aided design (CAD) field but to deny it access to three other programs.

Following Fujitsu's acquisition last year of 80% of ICL from UK-based **STC PLC**, JESSI has been reviewing the role of

ICL in five of JESSI's almost 70 projects.

The board said it "has invited ICL as a non-European-owned partner to take part in two projects under the subprogram auspices. These two projects are the CAD Frame project and a Euro-CAD project for board design. Three other requests were turned down."

An ICL spokesman said his firm "regretted the board's decision" but explained that because ICL participated only as a semiconductor user and not as a manufacturer, participation "has never been central or crucial" to the firm's survival. The spokesman also explained that ICL is already participating in the two

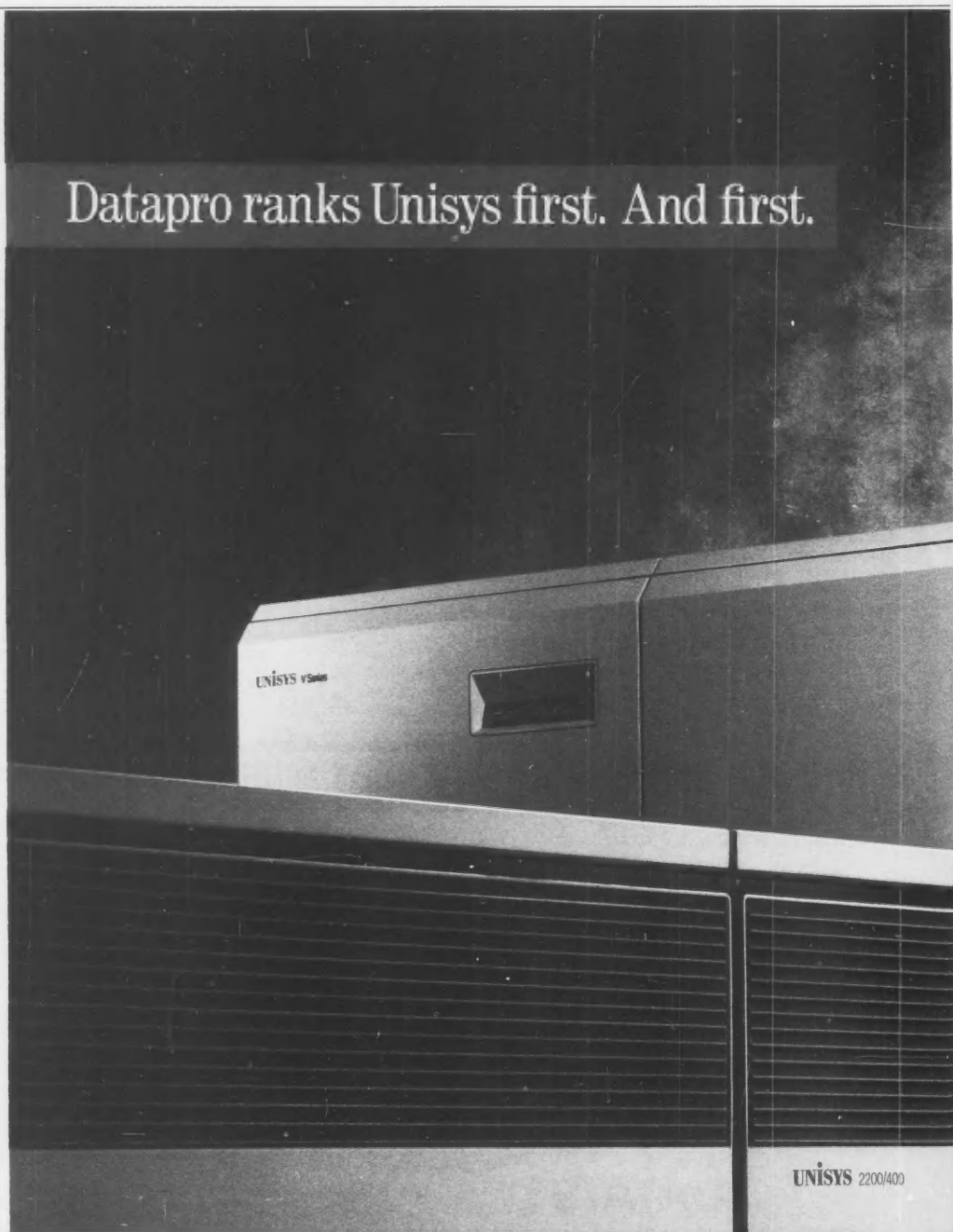
projects and that the decision simply curtails plans for an extension of the company's activities in JESSI.

He also said the decision raises "a further argument over ICL's ownership." He explained that "ICL is still European according to the European Commission's definition: ICL's headquarters are in Europe, its laboratories are in Europe, and the vast majority of its employees remain in Europe."

The spokesman pointed out that although ICL's "majority shareholder is Japanese, it still has a minority European shareholder and that under company law, ICL has clear obligations to protect the interests of all shareholders."

De Bony is Brussels correspondent for the IDG News Service.

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UNISYS 2200/400

Users fear support loss as result of dealer consolidations

BY RICHARD PASTORE
CW STAFF

With dealer consolidations now spreading to household names in the reseller community, users are beginning to sweat. They fear that recent mergers will inject more chaos into the customer-dealer relationship without solving any of the problems of poor support and rapid turnover.

The latest case of consolidation is Computerland Corp.'s planned acquisition

of Nynex Corp.'s Business Centers, announced late last month. Although the firms have not released all of the details, reports said Computerland will pay \$150 million for Nynex's 77 stores, formerly IBM's Business Centers. In a smaller deal, Compucom Systems, Inc. is expected to shortly consummate its \$39 million buyout of 63 of The Computer Factory Store, Inc. stores.

Users at many large corporate sites said traditional personal computer deal-

ers have failed to provide adequate support for their complex PC networks and mission-critical systems. The recent mergers and restructurings will not help and may actually exacerbate the problems, they added.

The PC buyer often gets caught up in the bureaucratic chaos that comes with mergers, users said. In addition, promised changes for the better rarely materialize.

"We have had many of our dealers bought out, and it usually gets worse," said Andrei Chivvis, first vice president at Financial Guaranty Insurance Co. in New York.

For example, after JWP, Inc. bought dealer NEECO, Inc. one year ago, the firm promised customers extensive improvements in support capabilities. "That

[promise] rapidly fell apart," said John Geyer, Financial Guaranty's vice president and director of systems. "We have high-end Compaq equipment here that they can't repair."

Confusing the customers

Other users complained that following a merger, resellers downsize and often close convenient store locations. Good technical staff people may quit or be let go.

Businessland, Inc.'s restructuring in December has caused some confusion. Although the dealer split its business into four sectors, there was to be a single point of contact. But one user received four cold calls in January from different Businessland representatives claiming they would be his exclusive contact person.

"They didn't quite have their act together," said Gerard Nussbaum, director of MIS at Premier Hospitals Alliance, Inc.

On the dealer front

Consolidation takes over:

Nov. 1990 Compucom Systems, Inc. plans to buy 63 Computer Factory, Inc. stores.

Dec. 1990 After one year of losses, Businessland, Inc. slashes nearly 25% of work force and segments itself into four business units.

March 1991 Computerland, Inc. says it will buy 77 Nynex Corp. Business Centers.

Manufacturers take matters into their own hands:

Dec. 1990 AST Research, Inc. adds Saturday to its weekday toll-free telephone and 24-hour fax support.

Feb. 1991 Compaq Computer Corp. offers direct toll-free support and telephone contract service; also segments specialized dealers.

CW Chart: Marie Haines

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*Based on statistically significant results compiled by Datapro. Sources: U.S. Users' Ratings of Mainframes, 1990; Datapro Research Group; Nikkei Computer Survey, 1990; Nikkei Business Publications; French User Ratings of Mainframes, 1990; Datapro Research Group. Unisys is a registered trademark of Unisys Corporation. © 1991 Unisys Corporation.

We make it happen

Microsoft plans Hong Kong strategy

BY DON TENNANT
IDG NEWS SERVICE

HONG KONG — Citing the conservative nature of his company, a Microsoft Corp. executive has affirmed that it may be another 18 months before Microsoft opens an office here, despite his

assessment that the local market is ready for the move.

For now, the firm will rely on its newly established dual distributor arrangement to market and support its products here — an arrangement Microsoft is counting on to drive local sales of its Windows and LAN Manager

packages, said Steven Husband, the company's Asia Pacific business development manager.

Husband shed light on his company's plans for Hong Kong during a visit to the territory last month to formally announce the appointment of local firm ACA Pacific as the territory's second

Microsoft distributor.

Husband discussed Microsoft's intentions in light of a statement issued for the occasion by Asia Pacific regional manager Rick Tsang: "We added a second distributor in Hong Kong because of its importance as a market to Microsoft, its central location in the Asia region, Hong Kong's growing information technology market, commu-

nications facilities and the high number of personal computers per capita."

Responding to an observation that it is just those factors that other vendors cite as reasons for opening an office here, Husband indicated that Microsoft is apprehensive because some companies that have taken that step have flopped.

"We come in for the long term," he said, adding that the company will only establish a local office when it is certain that local market conditions can sustain one. "We are a very conservative company," Husband said.

Making the move

Asked when Hong Kong would be able to sustain a Microsoft office, Husband said frankly, "I feel Hong Kong can sustain an office now." But he added that it could be as early as June or as late as a year and a half from now before Microsoft decides to make that move.

For now, Microsoft is content to operate through its two distributors, Gilman Business Systems and newly appointed ACA Pacific. According to Husband, the firm has no plans to name any additional Hong Kong distributors. Asked specifically whether hopeful contender Imagineering was still under consideration, given Imagineering general manager Edward Li's contention that the appointment of his company as a third distributor is imminent, Husband stated categorically that Microsoft has no intention of adding the company to its distributor list.

When asked how Microsoft will prevent channel conflicts now that it has two distributors here, Husband indicated that rather than assigning territories or preferred platforms, he is depending on the distributors to police themselves.

Tennant writes for Computerworld Hong Kong, an IDG publication.

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- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Program kicked off in Japan

BY GARY H. ANTHES
CW STAFF

A small but politically significant program to help U.S. companies penetrate Japanese markets has been kicked off in Tokyo. Commerce Secretary Robert A. Mosbacher traveled to Japan with the chief executives of 14 handpicked U.S. companies, and he delivered a blunt warning to "blow the whistle" on any unfair trade barriers the companies meet.

Twenty firms — including computer industry entries Oracle Systems Corp., Electronic Data Systems Corp., Masstor Systems Corp. and Compaq Computer Corp. — were selected from a pool of more than 120 applicants for participation in the U.S. Department of Commerce's Japan Corporate Program. The companies were chosen in part for their "long-term commitment to compete aggressively in the Japanese market," Mosbacher said. To his reported embarrassment, however, officials of six of the companies failed to show up in Tokyo.

The program is as close as the Bush administration has come to embracing elements of industrial policy, often derided

by free-market thinkers as "picking winners and losers." The 20 companies picked to join in Japan will get help from the Commerce Department in the form of market data, marketing and distribution advice, introductions to key Japanese buyers and other types of hand-holding. They are also likely to benefit from the spotlight reflected off them onto Japanese officials sensitive to charges of unfair trade practices.

Commitment to fair trade

Companies selected have made five-year commitments to:

- Make four visits to Japan annually, including two by the chief executive officer.
- Publish product literature in Japanese.
- Participate in one or more Japanese trade shows annually.
- Modify products as needed for the Japanese market.
- Provide after-sales service.
- Provide Japanese sales figures to the Commerce Department.

The Commerce Department has pledged to:

- Develop market data and five-year sales projections for participants.
- Introduce companies to senior Japanese corporate managers.
- Help solve problems involving patents, trademarks and standards.
- Recommend marketing strategies and business structures.

In return, the companies have made minimum five-year commitments to go after Japanese business in a serious way, including frequent visits by senior company officials, modification of products for Japanese buyers and the establishment of service units in Japan.

"It certainly does give us a competitive advantage in Japan," said Charles Griffis, chief financial officer at \$50 million-per-year Masstor. "It's the only way a company our size can enter that market." Masstor, which sells 80% of its data storage devices and systems in Europe, was

picked for the program for its exporting capabilities, Griffis said. The company will sell, install and maintain its products in Japan, most likely through an agency or joint venture, he said.

The company will face competition from much larger firms including IBM, Hitachi Ltd. and Fujitsu Ltd. but hopes Masstor will have \$50 million in Japanese business annually after five years, Griffis said. "It will either be a success or it won't. It will be either zero or \$50 million-plus," he added.

Asked if the arrangement offers Compaq a competitive advantage, Compaq spokesman Rick Scott said, "It's impossible to say at this point. We didn't view the program as a way to get a competitive advantage."

Calls to competitors of those companies selected turned up a surprising lack of interest and knowledge about the program. A spokesman for an EDS competitor said his firm had little interest in doing business in Japan and so had not applied. A spokesman for the Commerce Department said the agency has not yet made plans for the next round of competition for the program. However, in a written statement, Mosbacher said, "We expect the number of American businesses involved in this initiative to quickly escalate."

IBM compatibles

CONTINUED FROM PAGE 81

and multiprocessor systems markets.

"People aren't looking at IBM to lead the way anymore," said David Kirkey, vice president of marketing at Advanced Logic Research, Inc. (ALR). "We have to do something different than the big guys and offer more value."

ALR, along with AST Research, Inc. and several other clone makers, was among the first to incorporate CPU-up-

gradable architectures. IBM did not design an upgradable PC from the ground up until last year. ALR has also joined Compaq and a handful of other compatible vendors in the multiprocessor architecture market.

While vendors such as Compaq and ALR said they are diverging from IBM to succeed in a crowded marketplace, many pointed to IBM as the instigator of the split.

In the formative years of the PC industry, IBM's every action amounted to a desktop standard, observers noted. IBM

lost this clout four years ago when it introduced its Micro Channel Architecture (MCA) bus, which was incompatible with the AT-style bus and add-in boards present in all IBM-compatible PCs at the time. In effect, "IBM thumbed its nose at the entire industry. It tried to force MCA down our throats," said Michael Krieger, senior manager of advanced systems at AST.

The Gang of Nine, which included Compaq, AST and seven other compatible makers, responded by collaborating on the Extended Industry Standard Architecture bus, which remains compatible with IBM's original AT bus design.

IBM's latest video graphics technology, Extended Graphics Array (XGA), does not appear to be catching on as a standard, as its Video Graphics Array (VGA) did before.

"We're not quite convinced XGA will become a standard. We see other ways to do [XGA-like] graphics better than that spec," said Ron Okamoto, director of PC/graphics product marketing at Wyse

Technology.

Compaq is already working on its own non-XGA-compatible graphics implementation. According to Stimac, it will be announced soon and will provide considerably higher performance. AST also has no plans to adopt XGA.

"IBM was very slow getting the VGA specs out," Krieger said.

The divergence extends beyond hardware. While IBM had hoped the industry would embrace its OS/2 as the new PC operating system standard, the software has experienced a resounding lack of acceptance among users. Several compatible vendors have given their tacit endorsement to OS/2's rival — Microsoft Corp.'s Windows/DOS environment — by bundling Windows with off-the-shelf PCs. No one is bundling OS/2 this way.

IBM may take the matter into its own hands, however. Reports said the firm is considering bundling OS/2 Version 2.0 with every Intel Corp. 80386-based PC it sells.



Compaq's Stimac: *"If I just copied IBM's hardware, then I could be no better than IBM"*

Making a choice

For users, the divergence between IBM and PC clone vendors may mean more choices and greater innovation. But it also injects a good deal of confusion into the once simple universe of the IBM PC compatible.

The differentiating moves of some compatible makers are in large part beneficial to users. As more third-party developers embrace non-IBM architecture such as Extended Industry Standard Architecture (EISA) and multiprocessor implementations, competition among these developers will increase, product choices will proliferate, and prices will drop, said Ben Rose, senior analyst at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

However, many users said they feel burdened by the divergence. "It was easier when IBM called the tune, and everybody had to dance to it," said Stephen Anderson, an information systems architect for the state of Washington. "For someone in my position, the more diversity you get, the tougher it gets."

Many users first saw evidence of divergence when IBM developed its MCA bus. "IBM made a mistake with the Micro Channel because of the incompatibility. If you go with Micro Channel, you're talking all new equipment, all new boards," said Fred Fisher, president of Surplus Risk Services/The Fisher Associates, a Los Angeles-based insurance adjuster.

Now, users are caught in a rivalry between MCA and the competing EISA. "You've got to make a choice between them. There's too much difficulty in maintaining two sets of [incompatible] network boards and add-in cards," Anderson said.

If anything, in the eyes of analysts and users, IBM is becoming less committed to open standards than are compatible vendors.

"Lately, IBM's product implementations have gotten more and more specific to the Micro Channel," said New York-based network consultant Brian Livingston.

"The whole industry is talking about open architecture, but you've got two standards in competition," Fisher said. "I'd hate to think that schism will broaden even more."

RICHARD PASTORE

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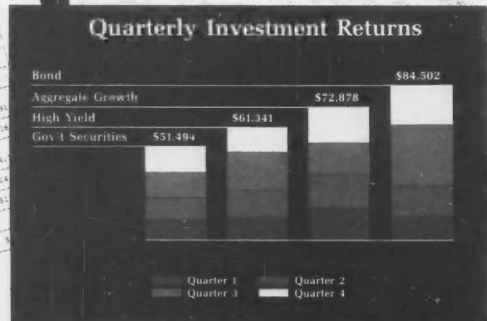
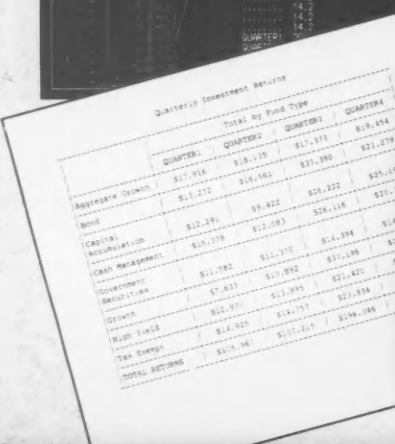


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COMPUTER CAREERS

CASE 'change agents' to light path for others

BY CARMEN D. WISEMAN
SPECIAL TO CW

What do you get when you cross a software developer with an information systems professional who has a flair for business strategies? A strong candidate for computer-aided software engineering (CASE). But don't get too excited: Demand for this unique IS developer will not ignite for a few more years. For now, companies are looking for CASE workers who not only possess strong marketing and interpersonal skills but also play a large part in getting the technology into the company in the first place.

CASE has penetrated only 15% of U.S. organizations, the bulk of which are Fortune 100 financial service and insurance firms, says Vaughan Merlyn, a partner at Ernst & Young's Center for Information Technology and Strategy in Boston. Although other industry watchers note the technology's steady inroads into airlines, health care institutions and government agen-

cies (such as the Library of Congress), they warn that growth is very gradual.

"CASE is so new it has to be sold to many companies. That's why the biggest current need is for CASE advocates, strategists and implementors," says technical recruiter Norm Sanders at Norm Sanders Associates in Hazlet, N.J.

Such individuals are what Kurt Wilkinson, vice president of the advanced technology practice at recruiting firm Halbrecht and Co. in Fairfax, Va., calls "CASE change agents."

A change agent operates under the aegis of the chief information officer or senior

IS director and may make up to \$100,000 annually. This agent (there's likely to be just one in a CASE start-up scenario) must be a business-savvy, marketing-oriented professional who is also technically proficient, he adds.

"Change agents don't always have to have IS backgrounds, but they should understand the enterprise modeling concept and how business processes work," Wilkinson says. "If they are only technically knowledgeable, they won't understand how organiza-

tions do business — and they won't be able to change the way their own organizations do business."

According to Merlyn, companies are looking for "visionary marketers" to get CASE rolling. Instead of recruiting only computer science graduates, they're also going after professionals with MBAs or sociology degrees who may have more of the people skills required for CASE advocacy and implementation.

A change agent must have excellent interpersonal skills to work with veteran software developers who think CASE tools will put their jobs in jeopardy. The agent must reassure developers that CASE tools are simply productivity enhancers and may even free the developer from humdrum maintenance tasks for more interesting work.

"Developers are eager to get involved with CASE once they realize it is just a tool and isn't going to take away their jobs," says Sharon Williams, director of IS staff development and training at Kaiser Foundation Health Plan in Walnut Creek, Calif.

The next step

Once a change agent has achieved high-level sponsorship of CASE throughout an organization, the next step is finding staff members to use the tools.

Today, most CASE professionals are selected and grown in-house. "Companies are training existing people in a base of tools, such as Knowledgeware," says Jack Mellon, group manager of

MIS planning and architecture at Ryder Truck Rental, Inc. in Miami. "They start in-house because they have confidence in their own people."

In addition, only a few computer science schools, such as Washington University in St. Louis, offer a CASE-centered curriculum, says Capers Jones, chairman of Software Productivity Research in Burlington, Mass.

However, once CASE is no longer the new kid on the block, traditional software developers who want to carve out a career in CASE will need to hone their

business skills first. But when that day comes, they will be in high demand. "Five years from now, CASE will be a necessity on resumes," Merlyn says.

So, whether you are an MBA with good communications skills or a developer piqued by leading-edge technology, there may be a place in CASE for you.

"If your career inclinations are in this direction, it's a no-lose situation," says Ed Ackley, a consultant at International Data Corp. in Framingham, Mass.

Wiseman is a free-lance writer based in Watertown, Mass.

CASE CASE

A peek at the future

Boeing Computer Services Division, unlike most U.S. companies, is not a CASE fledgling: It has been using CASE tools since 1984, says Wendy Wagner, project manager of CASE deployment at the Bellevue, Wash.-based firm. Now that the company is well past the start-up phase, she can give other firms a peek at the future.

Boeing's ideal CASE developer must understand the analysis design methods and techniques on which CASE is based. The company supplements this technical foundation with a strong in-house CASE training program. Boeing expands its in-house training programs every year, tailoring them to fit the tools and techniques the company is adopting.

Wagner notes that the need for on-site CASE advocates does not evaporate once senior management buys into CASE technology. Over time, however, the advocacy role shifts from the change agents to the developers on the team, so good communications skills are key. Boeing strategy relies on trained technical coordinators and others to spread CASE knowledge. The team thus provides a built-in support network for developers who feel uncomfortable working on CASE projects.

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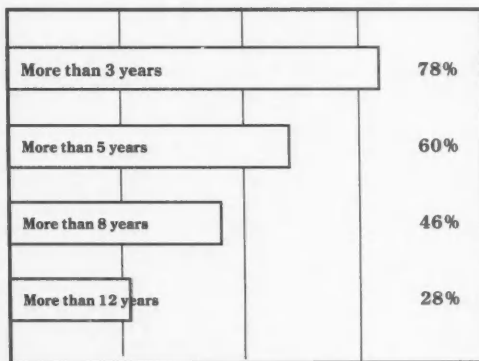
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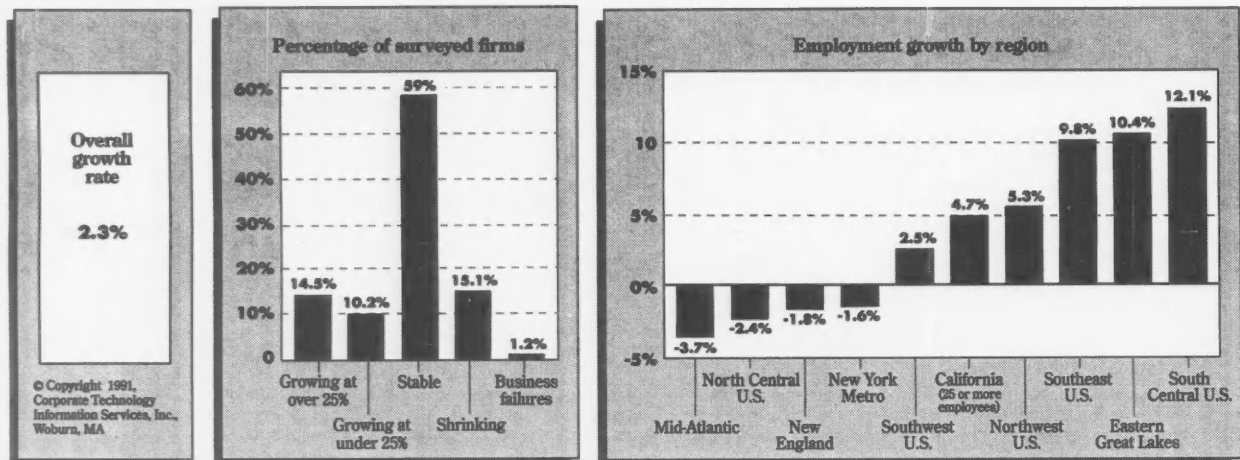
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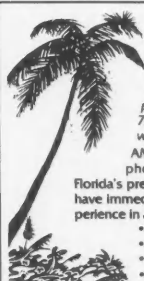
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MARKETPLACE

Do-it-yourself repairs cut costs, IS execs say

BY SUZANNE WEIXEL
SPECIAL TO CW

Last year, Columbus, Ohio-based accounting firm Groner Boyel & Gillan discovered, to its dismay, that 30% of its information systems budget was spent on equipment repairs. After careful consideration, the firm decided to get rid of all unnecessary service contracts and handle most of the repairs itself.

"We made major changes. Except for proprietary equipment, we now do all repairs in-house," says Jim Schmeltzer, supervisor of data processing.

The result? A preliminary forecast for the first quarter of this year indicates that repair expenses at the firm are down by about 82%, Schmeltzer says.

Keeping a lid on it

As IS managers struggle to keep a lid on spending, many indicate that savings can be found by fixing their own equipment. While in-house repairs aren't ideal for every situation, managers say they are reducing service budgets, minimizing downtime and bolstering productivity.

"The cost of on-site service is just getting too high," says Alan Herman, vice president of electronic data processing at Jacobson Stores, Inc. in Jackson, Mich.

At Garber Travel Service, Inc. in Brookline, Mass., maximizing uptime is the most significant reason for stocking parts and performing in-house equipment repairs, says Rock Blanco, vice president of IS. Outside service companies often guarantee a four-hour turnaround, but that's not fast enough, he says. "Why should I wait when I can fix it myself?"

Two years ago, all of Garber Travel's repairs and replacements were handled by a third-party service company. The cost in terms of contract fees and downtime was enormous, Blanco says, so he looked into bringing repairs in-house. He also considered ease of repair when deciding which personal computer would be the corporate standard. He opted for IBM Personal System/2s be-

cause of their simplicity. "I can grab a hard disk off the shelf and plug it in in no time," Blanco says.

Some IS managers indicate that stocking up on parts to perform in-house repairs not only saves time but can also come to the rescue of the entire business.

"With a PC in the patient-accounting department that brings in \$40,000 per day simply by being on-line, a faulty disk drive is no excuse for downtime," says Steve Cobleigh, manager of technical services at Winchester Hospital in Winchester, Mass.

Keeping a careful, detailed inventory is a key factor in performing in-house repairs. Blanco says that Garber Travel has designated a hardware specialist to stock parts that have high failure rates, such as Token Ring cards, hard disks, printer heads and fuses. Because of this extra attention, both employee productivity and the quality of service have increased, he says.

Cobleigh posts a spare parts list that includes everything from keyboards and monitors to PCs and modems so that the IS staff knows what is in use and where it is at all times.

Handling repairs in-house

takes a lot of consideration, and it's not right for everyone all the time.

At Winchester Hospital, Cobleigh carefully weighs each repair situation in terms of cost before deciding whether to send out equipment for repairs or do it himself. To help him in his decision-making, he developed an equation: He compares the length of time it takes to return a system to working order with the cost of maintaining spare parts. "Do we keep a spare file server in the closet? No. Do we keep a spare network interface card? Yes," he says. But, he adds, returning to uptime is the prime concern. Cost is secondary.

In a company as large as Richardson Electronics Ltd., it is not always cost-effective to fix things in-house, says Eric Powell, vice president of information services at the LaFox, Ill.-based company. To cover all the different kinds of technologies, ranging from mainframes to wide-area networks to dumb terminals and PCs, Powell says, he would have to maintain a large staff of technicians with a broad base of knowledge. To determine which parts he should stock and which he should leave to an outside service provider, he considers the cost of a service contract and labor, how critical the equipment is, how fast a turnaround time is

required and how many parts he would have to keep in inventory.

Sending out equipment for repairs also makes sense if the inoperable equipment is more sophisticated than an IS department can handle.

Garber Travel still contracts

HANDLING REPAIRS in-house takes a lot of consideration, and it's not right for everyone all the time.

with third-party service companies for problems that are more complex than just replacing a part and malfunctions that occur at locations far from corporate headquarters.

At the remote offices, Blanco says, he cannot guarantee the work if he is not there to supervise it, so he entrusts it to a third-party company. For problems that he judges too complex or too expensive to handle in-house, Blanco sometimes uses what is known as a depot maintenance agreement. For instance, if a printer fails, he can swap in a replacement and send the original out to be fixed. That way, time is not as much of an issue.

Weixel is a free-lance writer based in Framingham, Mass.



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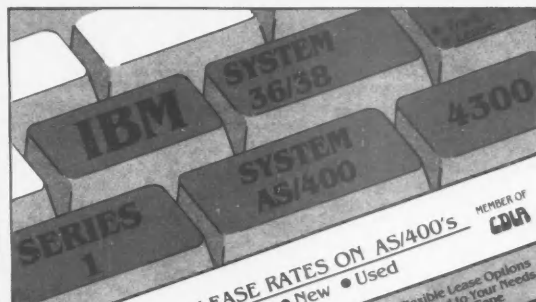
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RFP 2000, due Thurs, 5/02/91 at 3:30 p.m. for two turnkey systems for JONES COUNTY JUNIOR COLLEGE: a minicomputer-based system with related peripherals & software; and a 30-station LAN to connect to the minicomputer.

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EDUCATION & TRAINING

Old lessons learned in a new land

Head of the Class is a monthly column exploring innovative training approaches.

BY PETER FINGAR
SPECIAL TO CW

One August night in 1975, I stepped on Saudi Arabian soil for the first time to organize and implement an applications programming school for a small group of Saudi government employees. I knew at the time that this would not be an ordinary assignment, but I had no idea I would go on to live in the Middle East for 14 years or that I would carry away from this desert kingdom important lessons in training.

That pilot program was conducted 16 years ago. During those years, I worked in different training jobs at Arabian Data Systems in Jeddah, King Fahd University of Petroleum and Minerals and the Saudi Aramco, both in Dhahran.

I am currently director of computing at the University of Tampa in Florida, and I still use the methods I learned from my early experiences in Saudi Arabia.

That first assignment was to prepare a group of workers from various government departments in Riyadh to staff the many com-

puter projects planned throughout the Saudi government.

This presented a challenge for two reasons: None of the trainees, with the exception of one, had ever worked on a computer before, and all of the students spoke English as their second language.

English is the de facto language of computing in the Middle East. Some trainees had just completed their intensive English language training the month before. Among themselves, they spoke Arabic dialects from different areas of Saudi Arabia; one trainee was from neighboring Yemen, where yet another dialect is spoken.

Rote learning

The secondary education received by most participants had a strong component of rote learning, and they easily committed to memory the definitions of technical terms. But because the focus of the training was on complex problem solving, technical vocabulary was not sufficient. Clearly, there were language and learning barriers to overcome in teaching complex programming and systems skills.

At the time, I felt that very basic teaching methods were in or-

der to handle such a problem. However, over the years, and especially after my return to the U.S., I realized that the solutions I found were actually tried-and-true techniques and could be universally applied to all users despite diverse abilities and backgrounds.

First, I emphasized building conceptual models from the top down. Top-down mapping of com-

puter projects planned throughout the Saudi government. However, over the years, and especially after my return to the U.S., I realized that the solutions I found were actually tried-and-true techniques and could be universally applied to all users despite diverse abilities and backgrounds.

language, he will begin his top-down approach with a very small yet complete program. Then, he will assign a small, complete programming exercise to the trainees.

Contrast this with the bottom-up approach, where weeks of syntax and programming language rules are studied. In the parts-to-whole approach, motivation and understanding dwindle as the trainees are lost in the massive amount of details.

Second, I rediscovered a very basic way to overcome language barriers: I reverted to pictures, the original form of human language. I used pictures of both technical things and of the methods and processes of technology. When words and pictures come together, a signal passes to the brain from two simultaneous input sources. This is why professional teachers are instructed in the correct use of pointers in classroom presentations. If the pointer is pointing out of sync with the words being spoken, learning drops off immediately. When words and pictures are used together, communication increases dramatically.

Since the mid-1970s, great progress has been made in the use of computers in Saudi Arabia. Today, some of the original trainees are systems managers in government and business. The mar-

ble and granite offices in the desert sands of Dhahran house some of the world's most advanced technology.

The Aramco network

Aramco deploys networked IBM 3090s, Cray Research, Inc. supercomputers, Intergraph Corp. and Genegraphics computer-aided design technology and global Systems Network Architecture and packet-switching networks that bounce off Arabsat satellite and through optical fibers. The oil giant offers more than 50 computer subjects to thousands of employees each year.

Next door to the oil company, King Fahd University of Petroleum and Minerals has implemented a full-fledged College of Computer Science and Engineering with a growing number of Saudi Ph.D.s on the faculty. Computing education and training remain strategic priorities in the kingdom.

I look forward to returning to Saudi Arabia for short-term teaching and consulting assignments in one of the most fascinating computing environments on the planet.

And I continue to use the lessons I learned in the desert sand to meet training challenges here at home.

Fingar is director of computing at the University of Tampa. He lived in Saudi Arabia for 10 years and is the author of *Computing Illustrated*, a book for end users.



COMPUTERWORLD

April Training Editorial Topics

22 What's new with computer-based training?
Product Spotlight: CASE tools
Close: April 16

29 How the nuclear industry handles technical training
Executive Report: How CEOs and CFOs Evaluate IS
Close: April 23



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INDUSTRY ALMANAC

HIGHFLIERS

Micron Technology, Inc., maker of 1M-bit dynamic random-access memory chips, is currently trading near its 52-week high. Japanese DRAM makers have cut production, thereby inflating their prices, according to Larry Hickey, a First Analysis Corp. analyst. Micron, he said, is ready to pounce on the newly recharged market.

Not all stocks at new zeniths are good buys. **Computer Task Group, Inc.** will increase earnings by a modest 10% this year, said Cato Carpenter, an analyst at Alex. Brown & Sons, Inc. He called Computer Task Group a "hold." Although Carpenter said the recession will deflate the prices of most service stocks, he likes **American Management Systems, Inc.**, a Computer Task Group competitor. Profits at American Management will rise 20% in 1991, in part because of its dedication to research and development, he said.

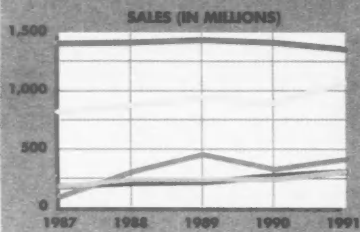
With its Amiga computer, **Commodore International Ltd.** "is the only company that combines personal computer functionality with the ease of use of consumer electronics," said Steve Eskenazi, an Alex. Brown & Sons analyst who said he expects the stock to reach \$24 to \$28 in the near term. Fiscal year 1991 revenue will jump 20% over last year, he predicted.

Tektronix, Inc. is rated a "hold" now by Laura Conigliaro, an analyst at Prudential Securities, Inc., but she noted that significant revenue growth over the long term can make Tektronix attractive. The company has shown "exceptional expense control," she added.

KIM S. NASH

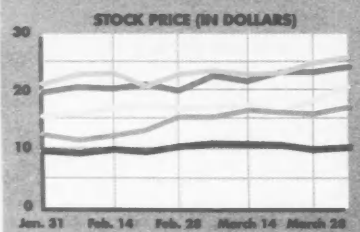
While analysts predict scorching 1991 sales...

Annual revenue for the group has climbed since 1987 and is expected to come on strong this year



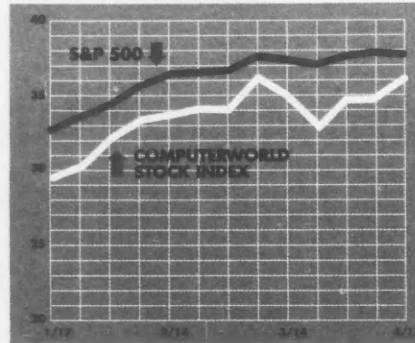
... investors clamor for these hot stocks

Buyers have pushed share prices for the group higher in anticipation of strong quarterly financials



— American Management Systems, Inc.
— Commodore International Ltd.
— Computer Task Group, Inc.
— Micron Technology, Inc.
— Tektronix, Inc.

STOCK TRADING INDEX



Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, APRIL 12, 1991, 1991

TOP PERCENT GAINERS

Alloy Computer Prod.	75.00
Informa Corp.	90.43
Micropolis Corp.	26.79
Cognos Inc.	18.89
Micrograph	19.44

TOP DOLLAR GAINERS

Intel Corp.	5.00
Motors Inc.	5.50
Texas Instruments	4.38
Computer Sciences	4.25
Micropolis Corp.	3.75

TOP PERCENT LOSERS

Infotek Systems Corp.	-14.29
Ariel Communication Corp.	-14.29
Banetec Inc.	-11.32
Comshare Inc.	-10.59
Capital Associates	-10.16

TOP DOLLAR LOSERS

IBM	-4.75
Microsoft Corp.	-2.75
Comshare Inc.	-2.25
Symantec Corp.	-2.25
Compression Labs Inc.	-1.88

Communications and Network Services Off 0.21%

Exch	52-Week Range	Apr 12 Close	Wk Net Change	Wk Pct Change
OTC	19.00	5.38		
NYS	69.75	52.50		
OTC	44.13	59.00		
OTC	8.13	0.88		
NYS	56.25	39.50		
OTC	57.63	49.00		
NYS	41.25	13.13		
OTC	25.88	8.25		
NYS	41.25	23.38		
OTC	5.13	1.88		
NYS	26.75	8.88		
OTC	25.25	12.25		
OTC	12.88	5.00		
OTC	4.00	1.75		
NYS	4.50	1.63		
NYS	34.13	23.50		
OTC	6.25	0.75		
OTC	60.88	40.25		
OTC	44.13	17.88		
OTC	21.00	2.75		
NYS	18.25	4.00		
OTC	14.63	3.00		
OTC	15.50	8.13		
NYS	32.63	22.13		
OTC	58.50	17.25		
NYS	89.50	67.00		
NYS	47.88	36.25		
ASE	15.38	4.75		
NYS	29.13	8.88		
NYS	59.50	47.25		
NYS	48.38	20.63		
NYS	40.75	32.38		
OTC	8.75	0.58		
ASE	18.88	10.00		
OTC	72.75	24.25		
OTC	13.88	4.25		
OTC	32.25	7.50		
OTC	2.38	0.13		
NYS	21.63	4.50		
NYS	74.25	36.50		
OTC	2.38	0.13		
NYS	21.38	6.75		
NYS	20.88	8.38		
NYS	51.25	20.00		
NYS	15.38	3.50		
NYS	3.25	0.75		
OTC	30.38	7.63		
NYS	85.13	45.50		
NYS	36.13	13.75		
NYS	52.00	24.88		
NYS	139.75	96.25		
OTC	14.00	7.75		
OTC	29.50	10.00		
OTC	3.13	0.50		
NYS	149.75	114.00		
OTC	26.00	9.00		
NYS	100.50	44.50		
OTC	35.50	11.00		
OTC	34.00	9.75		
NYS	47.25	18.00		
NYS	35.88	14.63		
OTC	37.25	15.00		
NYS	28.88	8.88		
NYS	39.50	23.50		
OTC	33.25	6.75		
NYS	7.88	1.38		
NYS	15.88	1.75		
ASE	5.75	2.00		

Computer Systems Up 2.62%

OTC	8.75	0.58		
ASE	18.88	10.00		
OTC	72.75	24.25		
OTC	13.88	4.25		
OTC	32.25	7.50		
OTC	2.38	0.13		
NYS	21.63	4.50		
NYS	74.25	36.50		
OTC	2.38	0.13		
NYS	21.38	6.75		
NYS	20.88	8.38		
NYS	51.25	20.00		
NYS	15.38	3.50		
NYS	3.25	0.75		
OTC	30.38	7.63		
NYS	85.13	45.50		
NYS	36.13	13.75		
NYS	52.00	24.88		
NYS	139.75	96.25		
OTC	14.00	7.75		
OTC	29.50	10.00		
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NYS	149.75	114.00		
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NYS	100.50	44.50		
OTC	35.50	11.00		
OTC	34.00	9.75		
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NYS	35.88	14.63		
OTC	37.25	15.00		
NYS	28.88	8.88		
NYS	39.50	23.50		
OTC	33.25	6.75		
NYS	7.88	1.38		
NYS	15.88	1.75		
ASE	5.75	2.00		

Software & DP Services Up 2.69%

OTC	62.00	17.00		
OTC	59.88	16.75		
OTC	26.50	12.00		
OTC	16.25	7.50		
NYS	4.63	1.38		
OTC	23.50	10.00		
OTC	13.25	4.88		

Up 2.62%

OTC	8.75	0.58		
ASE	18.88	10.00		
OTC	72.75	24.25		
OTC	13.88	4.25		
OTC	32.25	7.50		
OTC	2.38	0.13		
NYS	21.63	4.50		
NYS	74.25	36.50		
OTC	2.38	0.13		
NYS	21.38	6.75		
NYS	20.88	8.38		
NYS	51.25	20.00		
NYS	15.38	3.50		
NYS	3.25	0.75		
OTC	30.38	7.63		
NYS	85.13	45.50		
NYS	36.13	13.75		
NYS	52.00	24.88		
NYS	139.75	96.25		
OTC	14.00	7.75		
OTC	29.50	10.00		
OTC	3.13	0.50		
NYS	149.75	114.00		
OTC	26.00	9.00		
NYS	100.50	44.50		
OTC	35.50	11.00		
OTC	34.00	9.75		
NYS	47.25	18.00		
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OTC	62.00	17.00		
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OTC	16.25	7.50		
NYS	4.63	1.38		
OTC	23.50	10.00		
OTC	13.25	4.88		

THIS WEEK'S HIGHLIGHTS

- Earnings from semiconductor firms made investors happy, bolstering stock prices in the sector. Motorola, Inc.'s first-quarter profits fell compared with last year, but by less than analysts had feared; Motorola stock leapt 3 3/4 points to close Thursday at 62 1/2. Intel Corp. jumped 2 1/4 points to 52, and Advanced Micro Devices, Inc. advanced 1 1/2 points to a new high of 12 1/2. Both companies posted strong quarterly earnings last week.
- Among hardware firms, IBM lost 2 1/2 points to 110 1/2. NCR Corp. slid down 2 1/2 points to 95 1/2. AST Research, Inc. and Advanced Logic Research, Inc. each added 1 1/4 points to close at 32 and 18 1/4, respectively.
- Silicon Graphics, Inc., one of 21 vendors newly allied to support reduced instruction set computing chips from Mips Computer Systems, Inc., gained 2 1/4 points to 39 1/4; Mips slipped 1/4 of a point to 19 1/4. Meanwhile, Sun Microsystems, Inc., which is being challenged by the alliance, picked up 2 1/2 points to close at 35.

Exch 52-Week Range

Exch	52-Week Range	Apr 12 Close	Wk Net Change	Wk Pct Change
OTC	10.25	4.00		
NYS	68.25	45.25		
OTC	60.25	32.00		
OTC	31.50	27.25		
OTC	43.88	17.75		
OTC	21.50	11.00		
OTC	62.25	14.00		
NYS	9.88	0.88		
OTC	19.00	5.13		
NYS	16.88	4.38		
OTC	17.75	10.75		
NYS	70.50	36.75		
NYS	11.75	6.63		
OTC	25.25	13.00		
OTC	18.00	3.75		
NYS	47.00	27.88		
OTC	23.63	7.25		
OTC	5.75	1.88		
OTC	19.75	7.75		
OTC	17.50	2.83		
OTC	7.88	1.38		
OTC	8.00	2.50		
OTC	41.75	10.00		
OTC	45.00	16.75		
OTC	39.25	12.50		
OTC	32.00	13.63		
OTC	19.75	7.25		
NYS	50.50	4.00		
OTC	24.00	4.88		
OTC	18.13	7.00		
OTC	9.25	1.25		
NYS	52.00	31.63		
OTC	19.88	12.25		
OTC	13.13	6.88		
OTC	25.50	14.75		
OTC	19.88	12.25		
OTC	35.25	12.00		
NYS	14.50	5.50		
OTC	26.00	13.50		
OTC	55.88	17.25		
NYS	24.50	4.50		
OTC	37.25	12.75		
OTC	27.38	4.75		

Semiconductors Up 4.83%

NYS	25.88	19.38		
NYS	11.88	5.50		
OTC	11.75	2.50		
OTC	54.25	28.00		
NYS	13.00	5.13		
NYS	18.13	6.75		
OTC	23.25	6.00		
NYS	88.88	45.75		
NYS	8.63	3.00		
NYS	45.88	22.50		
OTC	12.25	3.00		
ASE	14.88	4.00		

Peripherals & Subsystems Up 5.53%

OTC	1.38	0.09	Alloy Computer Prod.	0.88	0.38	75.00
OTC	2.56	0.88	Aperture Technologies	2.56	1.19	7.92
OTC	24.00	7.75	Banctec Inc.	11.75	-1.50	-11.32
ASE	11.50	4.13	Cognitronics Corp.	11.50	0.75	6.96
NYS	31.25	14.63	Computer Peripherals	26.25	2.38	9.88
ASE	22.00	7.00	Dataram Corp.	10.75	0.25	2.38
NYS	11.88	4.25	EMC Corp.	11.88	0.25	2.18
NYS	47.25	33.75	Eastman Kodak Co.	10.63	-0.88	-2.06
OTC	10.63	3.48	Eastman Kodak Co.	10.63	-0.88	-14.68
OTC	34.50	14.00	Evans & Sutherland	20.00	-1.00	-4.76
OTC	6.50	3.75	IomEGA Corp.	5.99	-0.25	-4.21
OTC	28.13	10.00	PS Systems Inc.	20.25	0.00	0.00
OTC	1.63	0.13	Master Systems	1.03	-0.09	-0.36
OTC	17.00	2.63	Maxtor Corp.	15.50	0.25	4.76
OTC	17.75	4.38	Micrologics Corp.	17.75	3.75	26.79
NYS	64.37	73.88	Micrologics Corp.	88.50	1.13	1.00
OTC	14.50	5.00	Printnrix Inc.	9.50	0.25	2.70
NYS	23.63	5.00	QMS Inc.	23.63	0.88	3.85
OTC	27.13	12.50	QMS Inc.	25.88	0.75	2.88
NYS	6.25	4.38	Recognition Equipment	5.88	0.00	0.00
OTC	9.88	4.00	Rexxon Inc.	9.88	0.38	3.95
OTC	19.75	5.63	Sage Technology	19.75	1.00	5.33
NYS	38.75	11.00	Storage Technology	37.63	0.63	3.00
OTC	4.00	1.25	Teatone Corp.	3.44	0.13	3.77
NYS	25.63	11.00	Tektronix Inc.	25.63	1.13	4.58
OTC	0.63	0.13	Thermal Systems	0.00	0.00	0.00
NYS	59.25	29.63	Xerox Corp.	58.00	1.00	1.75

IBM Credit

FROM PAGE 1

IBM mainframe users lease, rather than buy, their machines, according to Framingham, Mass.-based market research firm Technology Investment Strategies Corp. As of early January, some 70,000 IBM customers had approximately 700,000 separate IBM assets, leases or loans from ICC, fueling the firm to \$1.4 billion in 1990 revenue.

That track record, coupled with the stature of the IBM name and the subsidiary's ability to obtain low-cost financing based on its parent's credit rating, allows ICC to offer unbeatable deals to its users, said Moody's Investors Services, Inc. analyst Byron Walker.

However, it also arms ICC with the ability to bludgeon the competition and intimidate customers, according to many within the Computer Dealers and Lessors Association (CDLA), the trade organization that represents an estimated 80% of the companies that form the third-party computer leasing industry.

Users, too, have disparate views of ICC's power. Some feel strong-armed by the firm; others sense only a helping hand. "I've heard about all these wonderful deals that ICC offers, but I sure

haven't seen any," said the information systems director at a Midwest-based industrial company who asked for anonymity. His firm has been an ICC lessee since IBM first opened its subsidiary's doors, he said — however, he added, that status will soon terminate.

The IS director at a large East Coast services firm, who also asked for anonymity, agreed. "IBM feels that every time they walk in here, we should open our wallets," he said. "Last year, an ICC manager told us flat out that if we weren't going to buy more new equipment, we wouldn't be getting the same amount of attention and service. I've never done business with any company that's that hard to do business with."

That is far from a universal view. "We don't see ICC as the Big Bad Wolf," said an IS executive at a large industrial corporation on the East Coast. In his recounting, ICC emerged "hard-nosed but fair. They always close [the deal]; they always have the money. It's a pleasure to deal with them."

There is nothing bashful about ICC's goals. "In a perfect world, we would like to have a very competitive financing program wrapped around every product IBM sells," said IBM Vice President Harry L. Kavetas, president of ICC since 1986.

ICC president defends firm's motives, vision

ICC President Harry L. Kavetas held forth on issues most critically facing his company and the industry it is increasingly coming to dominate in an interview with Computerworld Senior Editor Nell Margolis:

• "Sure, we want to compete aggressively with the third-party lessors. But the real strategic competition we're facing is IBM's competition. It's Amdahl, Hitachi, Apple, DEC, Hewlett-Packard that I really want to

focus on when we're figuring out how IBM and ICC want to work together in this incredible marketplace."

• "Quality implementation is absolutely critical in a service company — even more so than in a manufacturing company. Manufacturing companies have other ways of differentiating themselves — capital investments, patents . . . Service companies either satisfy the customers or they don't, based directly on the quality of their ser-



Kavetas says ICC is not targeting third-party vendors

Toward that goal, which Kavetas speculated the firm could reach within the next three years, ICC is currently expanding on several fronts.

The firm is about to escalate its activity in the 27 to 30 foreign countries in which it is present, partly through the International Customer Financing System ICFS. The system, an on-line financing support and administration software package, has been in development for two years under the aegis of ICC's IS department and will begin a multistage rollout in June.

ICC is continuing its aggressive push into the end-user leasing market, offering a panoply of standard and specifically tailored deals directly to commercial cus-

tomers. This area currently accounts for some 80% of the firm's assets and approximately 90% of its profits.

The complementary area of channel financing — arranging finance packages in connection with the sale of products to value-added resellers — is now a billion-dollar business for ICC, Kavetas said, "and growing fast." Largely administered by an outside contractor, the channel business — estimated at 24% growth over the next year — has been brought back inside ICC during the past six months. "We wanted to put more of our own spin on it," Kavetas said.

In addition, he said, a massive

vice. For us, quality isn't a matter of value added — it's a question of survival."

• "Some of our competitors are fond of saying that ICC will do anything to close a deal . . . I can state categorically that ICC never makes a deal on which IBM does not expect to make a profit."

• "CDLA likes to make a big point of ICC's being unwilling to sit down and discuss things with them . . . Right now, they seem a lot more interested in telling me how unfair it is that we have advantages they don't."

• "I'm not interested in going to a meeting to listen to somebody tell me how much of my business I ought to be handing over to them."

10 years of ICC

A giant is just like us — only bigger, much, much bigger.

— James Lapine and Stephen Sondheim
Into The Woods

• ICC was conceived on Jan. 23, 1981, when IBM finance director Al Shapero went before the IBM Corporate Management Committee to suggest that the company form a financing subsidiary to expand its debt capacity and boost its future financing capacity.

• ICC has financed some \$42 billion worth of IBM-related transactions, earned \$887 million after taxes and produced an average return on equity of just under 19%.

• How big is it? ICC's first instruction manual on how to prepare a term lease and fill out a lease supplement, published in 1982, was nine pages long. The 1991 edition is three inches thick. It is also available on-line.

• How times do change: The midrange gave ICC its start in leasing, an ICC manager said. In the firm's early days, he recalled, "the high-end guys were sort of, 'go away, we have our own leasing companies out there.'"

• Who was ICC's first leasing customer? St. Joe Lead, of St. Louis, Mo.

• Who was ICC's first lease renewal customer? St. Joe Lead.

A head-on attack

In lawsuits against third-party companies earlier this year, ICC maintained that it is moving only to bar practices that rob it of its property and imperil its gilt-edged credit ratings. Stripping of IBM machines by other parties made it unable to account for computer parts, the company said.

Within the third-party and industry observer communities, the suits shone in a different light. "I am outraged by this attempt to spread fear, uncertainty and doubt in the marketplace," Comdisco President Kenneth Pontikes said.

"ICC is trying to control and dominate the computer leasing business," said W. Paul Fitzgerald, EMC chief financial officer.

After three suits in quick succession, Computer Dealers and Lessors Association (CDLA) President Kenneth Bouldin said, "it is now apparent that IBM and ICC intend a head-on attack on the industry represented by CDLA."

ICC's right to protect both its rightfully owned assets and its status as a secured borrower won widespread defense among third-party lessors and industry observers. Nonetheless, the perception persists of ICC and IBM using a defensible legal stance as a veil for threats against both competitors and customers that deal with ICC competitors.

ICC's aggressive onslaught is likely to cast a chill on the third-party memory market, said Thomas Donovan, an analyst at Technology Investment Strategies Corp.

The quick settlement by Cambex Corp. — only weeks after being sued and on terms that financially amounted to total capitulation, albeit without admission of wrongdoing — showed that the chill is already setting in, Donovan said.

CDLA — whose members have voted IBM/ICC practices their No. 1 concern for three years running, according to Gartner Group, Inc. — plans to fight back. Prior to the filing of the suits, the association of leasing firms hired the New York-based law firm of Weil, Gotshal & Manges to scrutinize IBM/ICC behavior with an eye toward possible violations of the 1965 Consent Decree.

It has also been keeping the U.S. Department of Justice apprised of IBM/ICC ways and means that could be seen as curtailing free movement of IBM machines on the market.

NELL MARGOLIS

Not-so-sleepy giant

IBM's finance subsidiary has built up a large asset base and strong revenue growth

	1986	1987	1988	1989	1990
Revenue	\$635M	\$706.8M	\$710.8M	\$1.05B	\$1.44B
Profits	\$118.1M	\$85.7M	\$130.5M	\$137M	\$165.5M
Assets	\$5.71B	\$6.45B	\$7.4B	\$9.47B	\$11.13B

Source: IBM Credit Corp.

CW Chart: Tom Monahan

tomers. This area currently accounts for some 80% of the firm's assets and approximately 90% of its profits.

The complementary area of channel financing — arranging finance packages in connection with the sale of products to value-added resellers — is now a billion-dollar business for ICC, Kavetas said, "and growing fast." Largely administered by an outside contractor, the channel business — estimated at 24% growth over the next year — has been brought back inside ICC during the past six months. "We wanted to put more of our own spin on it," Kavetas said.

In addition, he said, a massive

against third-party players early this winter. The firm accused leading independent lessor Comdisco, Inc. of cannibalizing IBM computers in the course of upgrades and reconfigurations done as part of subleasing deals. A week later, IBM-compatible memory vendors EMC Corp. and Cambex Corp. were served with similar suits.

The shots that ICC is taking at third-party firms could backfire, several analysts noted, if users begin to subscribe to the CDLA view of ICC and to fear the downstream consequences of tying their fortunes to a company that is on its way to virtually owning the market.

NEWS SHORTS

Ergonomics committee emerges

Bob Bettendorf, president of The Institute for Office Ergonomics, Inc. in Stamford, Conn., formed a committee of users and vendors last week to study the link between cumulative trauma disorders and computer use. The committee's goal is to sponsor scientific research and provide companies with guidance on ergonomics and successful intervention strategies, said Bettendorf, formerly IBM's director of VDT ergonomics. Committee members include Aetna Life and Casualty Co., Bank of America, Cigna Corp., ITT Hartford Insurance Group, McClatchy Newspapers, Inc. and US West as well as major vendors.

Intergraph wins huge Navy deal

The U.S. Navy awarded a 12-year, \$362 million contract to Intergraph Corp. last week to supply hardware, software and professional services for computer-aided design and manufacturing to support the design, construction and maintenance of Navy ships and shipboard systems. The Huntsville, Ala.-based firm will provide off-the-shelf gear, including 2,820 workstations, 450 servers and 11,000 mass storage devices as part of the Navy's \$2 billion CAD-2 program. The Navy said it solicited 500 bids but received only two; the second was from the Computervision subsidiary of Prime Computer, Inc.

Sprint moves to ISDN on FTS-2000

U.S. Sprint Communications Co. announced it has begun Integrated Services Digital Network (ISDN) service for the federal government's Federal Telecommunications System-2000 telecommunications network. Multiagency government centers in Auburn, Wash., and Kansas City, Mo., are now linked for a six-month trial with FTS-2000 via ISDN, allowing the transmission of voice, data and video information over a single digital circuit. Sprint said the government's first ISDN application will be to provide agencies with more accurate and detailed usage, billing and cost data.

Defendant settles in Novell suit

The first of several piracy suits filed this year by Novell, Inc. was settled out of court last week. Reliable Data Systems, Inc. in Baltimore paid Novell an undisclosed sum and agreed to stop selling unauthorized versions of Netware. Reliable admitted "some mistakes" in incorporating aspects of the Netware network operating system in office automation software it designs for waste management firms, according to a statement from Reliable President Steve Baldwin.

Dust settles at The Sierra Group

A two-year ownership battle over The Sierra Group, Inc. ended last week with Alliance Development Corp. acquiring the Scottsdale, Ariz., market research firm. The Sierra Group has been at the center of an ownership struggle between co-founders Marty Gruhn and Merily Shinyeda. Gruhn left the firm 18 months ago but has returned in an overseer's role as executive vice president of Alliance. Shinyeda has left the firm.

Lotus Notes officially on Vines

The six-company beta test of Lotus Development Corp.'s bulletin board-like Notes application on Banyan Systems, Inc.'s Virtual Networking System (Vines) network resulted in a formal announcement last week: Notes will soon be available to all users of the new Vines Version 4.10, drawing OS/2 clients into the Vines environment.

OMG gets Objectwindows

Borland International, Inc. moved to position its development tools as de facto Microsoft Corp. Windows programming standards last week when it announced that Objectwindows — a graphical interface used in object-oriented programming — has been handed over to the Object Management Group. The international consortium of systems vendors, software developers and users will in turn make the Objectwindows specification publicly available to developers, group officials said.

IRS in need of technology help

GAO report claims computers could help track billions of tax dollars

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Wealthy individuals who fail to file tax returns by midnight tonight can sleep with little fear of being dunned by a computer system that is likely to zap less affluent nonfilers.

That was one conclusion of the U.S. General Accounting Office (GAO), which also found recently that the IRS could improve its computer matching to eliminate millions of expensive and troublesome false alarms — returns incorrectly flagged for underreported income.

The IRS estimated that nonfilers cost the U.S. Department of the Treasury \$7 billion in 1987. Nonfilers are identified when income notices such as W-2 or 1099 forms fail to find a corresponding tax return in a computer match and subsequent notices mailed to the nonfiler fail to elicit a return. At that point, another computer system is used for modest-income nonfilers to calculate a substitute tax return and send notices showing estimated taxes, penalties and interest due.

However, high-income nonfilers are not assessed a penalty because the IRS feels their cases are likely to be so complex that a substitute return would understate taxes owed. Instead, agents in IRS collection offices try to resolve by mail or telephone those cases whose estimated tax yield relative to collec-

tion costs exceeds a certain threshold.

Cases below the threshold may remain inactive indefinitely. "We found nonfiler cases in the queue from tax year 1980 that may never be investigated because of their low estimated yield," a GAO report said.

doing another year's tax returns. It's too much trouble."

The GAO found that half of the 6.2 million suspected cases of underreporting pursued by the IRS in 1987 were "unproductive" — that is, taxpayers turned out not to owe more taxes. The GAO found that many of

Tax facts

- § More than 100 million U.S. tax returns are filed voluntarily by individuals each year. They are computer-matched against some 1 billion wage statements and other records of income.
- § In 1987, 4.2 million people failed to file tax returns, which cost the U.S. Department of the Treasury \$7 billion. The number of nonfilers jumped 26% between 1985 and 1987 and another 7% in 1988.
- § Some 40,000 nonfilers in 1987 had incomes above \$100,000.
- § In 1987, 17.9 million filers were suspected of underreporting income, at a cost to the Treasury Department of \$48 billion. The Internal Revenue Service investigated 6.2 million of these but found that in half the cases, taxpayers did not owe additional taxes.

Source: IRS and General Accounting Office

CW Chart: Doreen St. John

Based on samples of actual cases, the GAO estimated that referral of the high-income nonfilers to the automated returns program would yield \$1,716 in tax revenue for every dollar of collection costs, whereas the present manual system yields \$60 on average.

A GAO official who worked on the study said it was technologically feasible to do retroactive matching, but it would involve a considerable data processing effort. "And it's an issue of priorities," he said. "Two to four years later when these returns come in, they [IRS staff] are off

these unproductive cases could be eliminated through improved computer matching.

At a congressional hearing on the GAO findings last month, IRS commissioner Fred T. Goldberg Jr. said the IRS was implementing a number of the GAO's recommendations and would undertake others.

Goldberg said an automated underreporter project, to be tested at one service center this summer, will convert a "high-volume, paper-intensive manual process" into a paperless one in which all relevant information is available on-line.

Encryption

FROM PAGE 1

government does, and it is unclear when that endorsement will come, said Sanford Sherizen, president of Natick, Mass.-based Data Security Systems, Inc.

The U.S. Department of Commerce's National Institute of Standards and Technology, charged by Congress to set a public key-encryption standard, failed to adopt a standard last September as it said it would and has not set a new date.

DEC participated in a meeting hosted by RSA in February to discuss the endorsement of RSA's system as a standard, said Steven Lipner, manager of the secure systems group at DEC.

Lipner said that he was uncertain when the group would endorse the RSA system as a standard but added, "I wouldn't be surprised if some proposed standard came out imminently." Bid-

zos said that announcement is likely to come within a matter of days.

Conventional data encryption is based on an algorithm that encodes messages by translating them into series of numbers. Only holders of the mathematical key can encode or decode a message. Public key-encryption uses two keys — one public, the other private. Data encrypted with the public key can only be decrypted by a private key. Using two keys also creates a kind of digital signature that can be used to prove the authenticity of message senders.

The RSA encryption system, invented by three MIT mathematicians, is widely considered to be the best available because the algorithm relating the two keys is so advanced that it is virtually indecipherable.

The endorsement of RSA's system could be a significant boost for the tiny company, which has 12 employees and an-

nual sales of less than \$5 million. There are no public key-encryption standards for the commercial world.

Encrypting data, while not difficult, is an extra step that some users are unwilling to take, according to K. Y. Chiu, director

THE RSA ENCRYPTION system is widely considered to be the best available.

of customer services in the corporate MIS and telecommunications department at Motorola, Inc. in Schaumburg, Ill. "There is no question that a better system that is automatic is needed."

RSA has aggressively touted its system to vendors rather than attempting to market security products using its encryption system. "Encryption needs to be buried in the product to be safer, harder to tamper with and to be transparent to the user," Bidzos said.



NCR tone softening as AT&T hangs on

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Executives on both sides of the front line of the AT&T battle for ownership of NCR Corp. expressed frustration last week at the ongoing delays for a resolution.

In an interview last week, NCR Chairman Charles Exley Jr. indicated AT&T has been unwilling to discuss sales figures or NCR's new products, such as the Document Management System, which is scheduled to be released tomorrow.

Despite the apparent lack of movement, Exley's tone has softened considerably. "Everybody wants to see this thing resolved, one way or another," he said.

Exley backed away from an earlier promise to slash AT&T products, such as its 3B2 line of minicomputers.



"EVERYBODY WANTS to see this thing resolved, one way or another."

CHARLES EXLEY JR.
NCR

"All those things in the real world would require pretty careful consideration," he said, adding that he thought a merger had a good chance of success if NCR's management team controlled the combined companies.

Exley reiterated his stand that \$110 per share, or \$7.4 billion, was the lowest price he would recommend to his board, while AT&T stands firm at \$90 per share, with \$100 its apparent upper limit.

Apathetic attitude

Exley also told *Computerworld* that he has been "surprised" by AT&T's position. Robert Kavner, AT&T's group executive for Data Systems/Federal Systems, acknowledged that "there seems to be a lack of intensity of meetings, which we're confused about."

"One of the only benefits I know of about this long delay is that we've been able to think through a lot of details about [merging the businesses]," Kavner said.

AT&T expected NCR to welcome negotiations after statements Exley made at NCR's annual meeting March 28, according to Kavner. Most analysts said they think the price issue will be resolved in as little as two weeks.

"I think [they're] very close [to a deal]," said Harvey Poppel, partner at Broadview Associates in Fort Lee, N.J., a mergers and acquisitions firm specializing in high-tech industries. "What you're hearing from Exley is sufficiently accommodating."

Dissenter in crowd

One analyst who disagreed is Peter Labe, chairman of Labe, Simpson & Co. in New York.

"AT&T is going to pursue this. If you start with that, I think it leads you down a trail to the question, 'What is the incentive to NCR to rush things?' The incentive is to wait until next year's annual meeting," he said.

Between now and then — barring a deal — is a June 10 federal court date in Dayton, Ohio, where AT&T's suit against NCR's poison pill defense is scheduled to be heard. The presiding judge will be U.S. District Judge Walter Rice, who struck down NCR's employee stock ownership plan last month.



Seth Rensick

"ONE OF THE only benefits I know of about this long delay is that we've been able to think through a lot of details about [merging the businesses]."

ROBERT KAVNER
AT&T

Exley said he considers NCR's position in this case "a very strong one."

If he is right, NCR "would effectively be able to stall this for a year," said Maria Lewis, analyst at Cowen & Co. in Boston. If he is wrong, "it's over."

Final tallies from NCR's special and annual shareholders meetings were expected this week but are still being counted. Both sides said they think AT&T failed to oust NCR's entire board but succeeded in replacing the four directors up for re-election.

NCR will announce its first-quarter earnings today. Modest results are expected.

Intel riding high horse — for now

BY CAROL HILDEBRAND
CW STAFF

SANTA CLARA, Calif. — Microprocessor giant Intel Corp. posted record-breaking quarterly results for first-quarter 1991, exceeding analysts' expectations. However, shifting industry alliances could foreshadow future financial pressures.

Richard Whittington, an analyst at Kidder, Peabody & Co., said he expected that Intel was

486SX

FROM PAGE 1

"But people are beginning to worry about underpowering their desktops. New applications like graphics, imaging and multimedia will need something more powerful than a 386," he said. The 486SX will meet this need.

Sources close to AST Research, Inc. and Everex Systems, Inc. confirmed that those two companies have machines ready to go, and others believed to be in a similar situation include IBM, expected to announce its machines the week of Intel's announcement; Compaq Computer Corp.; Dell Computer Corp.; and Advanced Logic Research, Inc.

"The 386DX will peak this year, and [the 486SX] will supplant it — it's a natural migration," predicted one analyst, who asked not to be named.

Analysts said most major vendors and many smaller ones will introduce 486SX-based boxes within two weeks of Intel's chip announcement. Pricing is expected to fall between \$3,500 at the low end and \$13,000 at the high end.

Sources familiar with the AST and Everex strategies said the companies expect to market their machines as desktop models on the AT bus. But at least one AST user scorned the desktop strategy.

"What am I going to do with a 486 on a single desktop?" said Enrique Crespo Jr., corporate manager of user computing services at The Torrington Co., a division of Ingersoll-Rand Co.

Other users, such as John Geyer, vice president and director of systems at Financial Guar-

anty Insurance Co. in New York, said they expect to fill a need for high-powered file servers.

"During 1991, people will want to upgrade to a 486, and given the current costs, it's difficult to do that," Geyer said.

William Tiganelli, vice president of the Federal Reserve Bank in Baltimore, said he has users asking for upgrades to a 486 now, and the 486SX "will make upgrades more feasible."

Not impressed

Other users are less impressed. "The 486SX realistically is a 386 with a cache," said Mike Drips, a senior strategist at a major communications company. "Personally, if I were going to the 486 level, I certainly wouldn't be getting a 486SX."

Analysts said they expect IBM to charge around \$13,000 for a fully loaded SX box with 4M bytes of memory, a 320M-byte hard drive and its Extended Graphics Array video controller.

A source close to AST said the company would offer four desktop models based on the 486SX. Pricing has not been finalized, the source said.

All AST models will come with 4M bytes of memory, expandable to 16M bytes on the motherboard and 80M bytes total using external expansion.

Sources close to Everex said its two 486SX-based machines will run as fast as 13 million instructions per second under the High benchmark by Intelligent Devices. Everex will ship boxes standard with 4M bytes of memory, expandable to 64M bytes on the motherboard, and will leave video controller and hard drive decisions up to the buyer. Pricing has not been determined.

going to run into trouble from dark horse Advanced Micro Devices, Inc. (AMD) as well as the new consortium formed by the Mips Computer Systems, Inc./Microsoft Corp. reduced instruction set computing axis.

"At both ends of the spectrum, I think Intel is going to have its profit margin competed down very dramatically," Whittington said.

He also said he expected Intel to maintain revenue for the next quarter or two, but it will "really take a tumble in the second half of the year," he added.

Revenue for the quarter totaled \$1.13 billion, up 27% from the same period last year and up 8% from the fourth quarter of 1990.

According to Intel, its 80386DX, 80386SX and i486 chips shipped in record volumes this quarter.

AMD also ran in the black,

showing first-quarter sales of \$274 million and returning to profitability from a fourth-quarter loss of about \$43 million. The

"I THINK INTEL is going to have its profit margin competed down very dramatically."

RICHARD WHITTINGTON
KIDDER, PEAODY

fourth-quarter loss included \$6 million in severance pay resulting from personnel cutbacks.

The company pointed to belt-tightening measures and a strong new product mix as reasons for its renewed profitability.

Whittington said he expected AMD to continue its upward swing. "I think [AMD's clone] 386 chip is going to take a lot of unit market share and pricing away from Intel," he said.

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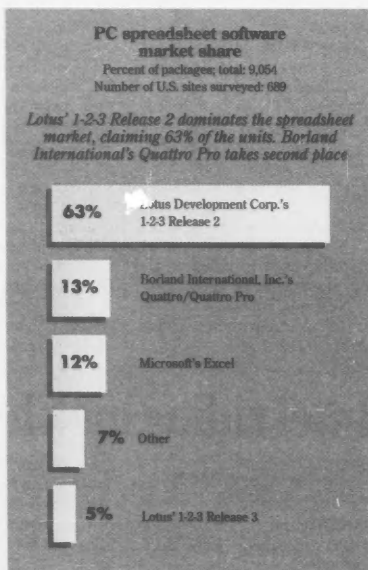
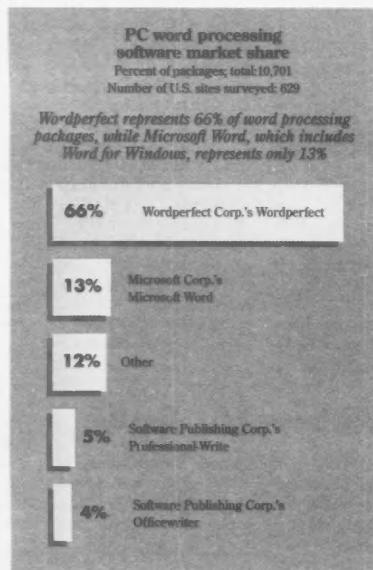
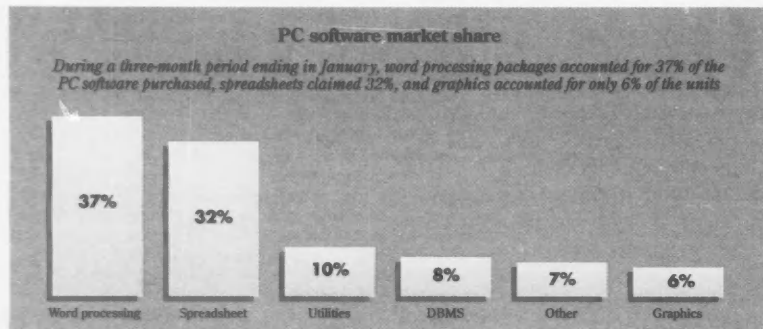
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TRENDS

PC SOFTWARE

The old faithfuls, word processing and spreadsheets, are the primary applications purchased for PCs. As Windows-based versions become available, the rankings of current market leaders may change depending on acceptance and the ability to properly run Windows

(Percentage of packages purchased during a three-month period ending January 1991)

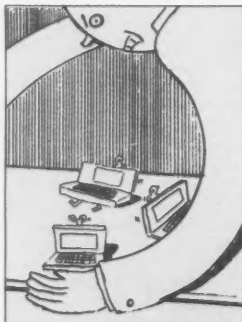


Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

How are IS departments managing the influx of **laptop computers**? There are many different approaches and many different issues, including purchasing, data security and insurance. Despite some headaches, most firms agree that laptops are not causing the upheaval that the PC revolution did in the 1980s. See Manager's Journal.



Gerrison Welland

Now that they have tried their new CASE packages, buyers of these tools have turned skeptical. The problem is that vendors cannot meet expectations as well as they raise them, especially when it comes to promises of integration, or "I-CASE." Find out the true meaning of this term and what you should ask before purchasing in Product Spotlight.

INSIDE LINES

Just how big is this market?

If you think the stakes in the RISC market aren't big, think again. In an effort to gain share of mind, both Sun and DG were scheduled to take to the airwaves Sunday in expensive campaigns to sell their wares. Sun's 30-second spot uses special effects to make viewers feel as if they are hurtling 100 miles per hour through the air in an action reminiscent of the air-scooter scene in *Return of the Jedi*. DG said last Friday that it was ready with a campaign that "stands apart for its clarity of message and avoidance of technical hocus-pocus." Yo, buddy, want some TCP/IP to go along with your burger and Bud?

Back on the bus

Just when you thought it was over, bus wars are back: Sources say Intel will introduce a new Extended Industry Standard Architecture chip set on April 22 as a tagalong to its 20-MHz 1486SX announcement. According to the sources, the internal code name for the EISA II chip set is "Mongoose."

Ah, togetherness!

Just a few weeks after IBM and AT&T shook hands on a deal to integrate their respective network management platforms, IBM is expected to announce this week a similar alliance with HP. Of course, IBM and HP got together previously to submit a distributed management system to the Open Software Foundation. The real question is when IBM and DEC will bury the hatchet. So far, the archrivals have only agreed to touch each other's systems by proxy through third parties.

If only we'd copyrighted the 'O' word

Is there any room left for another user advocacy group? Novell CEO Ray Noorda thinks so and has called for an Open User Recommended Systems (OURS) consortium. Long on ideals but short on specifics, OURS would create a cadre of users from such large industries as banking and aerospace, which would evaluate various multivendor networking setups and keep suppliers apprised of their needs. "We need to drive the industry to customer priorities," Noorda said. We didn't, of course, spoil the party by bringing up the disk mirror and global naming priorities Network customers have long been awaiting.

Now leaving home without it

There's no love lost between American Express and AT&T. After signing up for Tariff 12 and other network services some time ago, American Express was less than pleased when AT&T became a credit-card competitor last year with its Universal Card. "They are not a supplier any more," said Al Crawford, executive vice president of strategic business systems at Amex Travel Related Services in Phoenix.

Don't honor thy boss

Although Jim Sutter, Rockwell International's vice president of IS, was on the selection committee, it was American Airlines' Max Hopper who nominated Rockwell Chairman and CEO Donald Beall for this year's Gartner Group/Conference Board Excellence in Technology Award. Perhaps Sutter knew that last week's award ceremony in New York would force Beall to cut short his Mexican vacation, which it did.

OK! Last mention of RISC this week . . .

DEC will bring out a new low-end workstation based on RISC technology at the end of this month. The new box will be priced at less than \$10,000 and run at 15 MIPS or more, according to sources close to the company, and it will fit into the RISC-based Decstation line above the Decstation 3100.

Microsoft's Bill Gates took pains not to overstate his company's involvement in last week's Advanced Computing Environment party: "Don't exaggerate what I'm doing here. I'm going to go home today and buy two ice cream cones, and they'll say 'Bill Gates thinks ice cream comes to be the new dominant platform.' This whole thing is pretty noncontroversial." If you know what flavor he's standardized on, tip off News Editor Pete Bartolik at (800) 343-6474, send just the fax to (508) 875-9931 or send your licks over Compuserve at 76537,2413.

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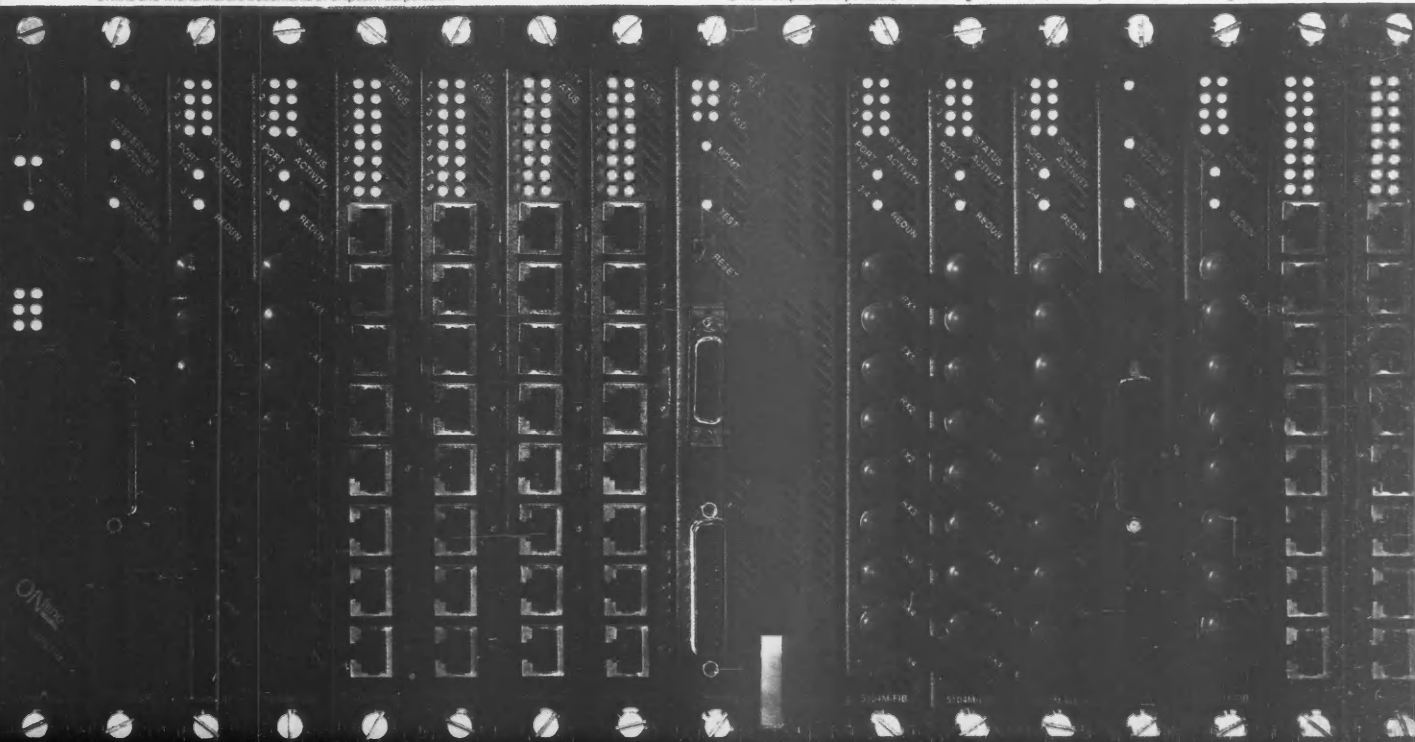


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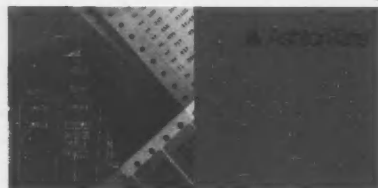
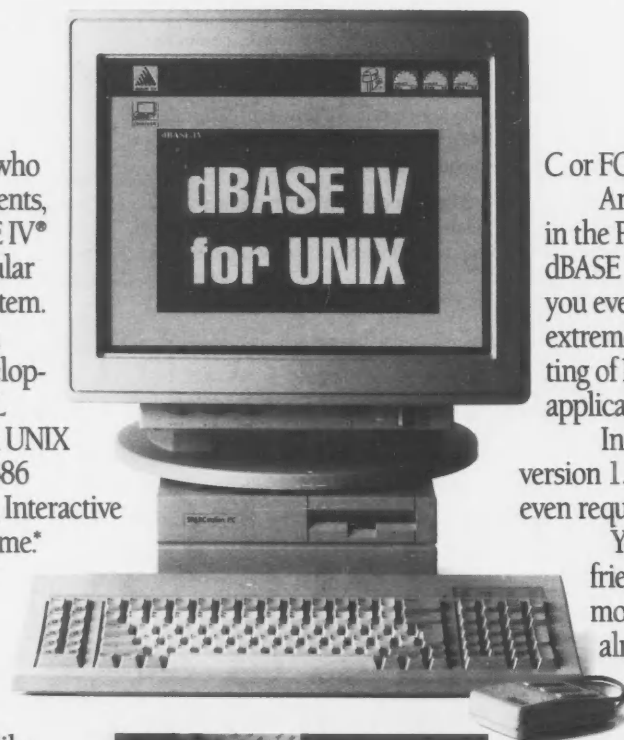
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